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TREATMENT OF TUBERCULOUS DISEASE OF THE SPINE.

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In considering the treatment of caries of the vertebral bodies, the following division of the subject aids in the description:

1. Early recognition of the disease.
2. Treatment in the acute stage.
3. Treatment of the sub-acute and chronic stages.
4. Treatment of the abscess and sinus.
5. Treatment of the paralysis.
6. Operative treatment.
7. The cessation of treatment.

1. *Early recognition* of this disease is of the utmost importance with reference to a perfect result and shortened duration of treatment. So much importance is attached to finding the case and beginning treatment in the early stage that nurses should be especially trained in the signs and symptoms that will aid in early diagnosis by them. It is a fact that many cases complain little of pain and disability, and escape the mother's attention. They may not escape the watchful eye of the nurse, but we find many who are neglected by her because she probably, rightly, gives her attention to the acute illnesses among the children of her district. Thus the tuberculous back patient is unfortunate enough to have its treatment begun only at a time when two, or three, and sometimes four vertebral bodies are actually destroyed and gone. These cannot be replaced. The loss in length of the column will never be regained. The long period of treatment will do no more than allow nature to callous in and about the extensively diseased area. On the other hand, if the case could come early, treatment would be shortened and the result would be better.

2. *Recumbency* is without doubt the treatment preferable in the beginning of the *acute stage*. This should be maintained for the first few days by keeping the child flat on its back in a surgical bed. The advantage of this type of bed, where the middle does not sag, is obvious, in that it tends to obliterate the inclination of the tuberculous back to form a backward, deforming projection.

In choosing the treatment for the acute stage, as also for the sub-acute and chronic stages, the position of the disease in the back must be taken into consideration. Disease below the seventh or eighth dorsal vertebra will do well during the beginning of treatment without apparatus when kept quietly on the back. If the disease is in the cervical, high, or middle dorsal region, relief from uncomfortableness and an advantage in the treatment are obtained by an apparatus which will allow extension of the parts. This is most easily obtained by placing a Sayer's halter over the chin and occiput. From a rope attached to this apparatus a weight equal to half a brick or three bricks is arranged so that it will extend beyond the head of the bed, thus giving traction.

On account of the absence of pain in the child's back, unless we devise some means for restraining the turning, twisting movements, it is frequently impossible to compel the patient to keep as quiet as is necessary for the most perfect calcification and ankylosis about the diseased vertebral bodies and spinous processes. Further restraint is best given by the use of a gas pipe frame, onto which the child is bound. This frame is made of one-half inch gas pipe, and the dimensions should be, in width, that of the child's shoulders, and, in length, that of the child, plus twelve inches. It should be covered with heavy canvas laced together beneath, leaving a space between the edges so that the slack from time to time may be taken up. This canvas should have an opening at the site of the child's

buttocks, to admit of a permanent drain. The frame should be suspended by two straps from each end, which are attached to the foot and the head of the bed. In the early treatment, the frame should be straight. Later, it should be bent gradually, in order to reduce in some degree the kyphosis. From now on, the burden of the successful management of the acute stage of this disease falls more to the nurse and mother than to the doctor. There are few nurses who are capable of so managing a case of tuberculous spondilitis as to prevent movements which,

Figure 1. Skeleton of healed tubercular spine, showing spinous processes and neighboring bone more or less ankylosed after periosteum has been worn away by friction. Preparation for ankylosis of this kind, but far more extensive, is the object of the operative work advocated by Hibbs. X indicating ankylosis.

though slight and infrequent, destroy the callous which has been in making for weeks.

No clothing should go over the child that does not embrace the frame along with the child's body, thus preventing movements of the shoulders and the back which are necessitated by fitting a shirt or jacket, which do not include the frame. No removal of the patient from the frame should be attempted unless two people who understand the technique used in turning the child are present. The best way, in my experience, is for one attendant to grasp the hips of the child, while another grasps the shoulders, carefully make traction, and then lift cautiously, and turn the patient on to the abdomen, guarding against motion in the spinal column. In this position the child's back should be bathed and the patient returned to the frame by the same method as that used in taking him from it. Frequently, cases do not get proper supportive fixation by means of the recumbent treatment aided by the frame, and I have supplied with satisfaction, in such instances, fixation with a metal brace or plaster cast while continuing the prone position in bed.

3. In the *sub-acute and chronic* stages, the patient, if possible, should have such fixation as will allow of ambulatory treatment. This is called for at a time when the back has progressed to a stage where a plaster jacket or metal brace can be applied without noticeable rigidity of the back muscles, and without fright or pain on the part of the patient. Support by means of a cast or brace which may be entirely hidden by clothing is most efficient when the disease is in the lower dorsal and upper lumbar region. However, if the cast or brace may have such head appliances as will control the upper dorsal and cervical vertebrae, grasping the head and thus immobilizing the neck, the ambulatory treatment with brace or cast becomes as efficient when the disease is in the upper region as when it is confined to the lower dorsal or lumbar part of the spine. When the disease, however, is in the lower lumbar region, the question of perfect fixation is probably the most difficult when ambulatory treatment is desired, for unless the apparatus comes down and includes the thighs so that the child does not walk, it is difficult to obtain satisfactory fixation for the disease. Therefore, where the tubercular process is in the lower lumbar vertebrae, ambulatory treatment is questionable, except in exceptional cases.

4. The most important advice regarding the *treatment of abscess* coming from tuberculous bone is: "Leave it alone." This is the treatment unless there is some urgent indications for interference. Such indications may be (1) disturbance caused by pressure; (2) mixed infection in

the abscess from within; (3) such a position of the abscess as to cause uncomfortableness to the patient. For instance, a large abscess on the back will be an annoyance when the child lies down; one situated on the inner side of the thigh will cause friction and interfere with walking, or one about the gluteal muscles will interfere with sitting. When an abscess is to be opened, great care should be taken that there is no chance for infection and that the mouth of the wound from which the pus has been drained is carefully closed.

The soreness and redness that persist about the sinus of an old abscess is relieved by either x-ray or radium treatments. However, as far as I have been able to conclude, the bone disease has not been improved by maximum doses given tuberculous joints on my hospital services.

The psoas contraction and flexion of the thigh often caused by burrowing of the pus from the spine, between the least resistant tissues along the sheath of the muscle, frequently complicates the disease when it occurs in the lower dorsal and lumbar region, and here a position of extension and abduction of the leg should be maintained by a carefully placed Buck's apparatus kept perfectly adjusted.

The treatment of *Pott's Paraplegia* embodies the treatment of the disease with emphasis on extension of the spinal column. Prognosis for this condition is generally considered good, and after treatment over a goodly length of time, the control of the limbs usually returns. However, in many of the adult cases this is found not to be true, even with the best of extension treatment. When recovery does not occur, the paraplegia is probably due to excessive enlargement and thickening of the membranes of the cord. *Lamenectomies* or *osteoplastic resections* of the spine have been done in these cases. Although these operations have in each case given slight improvement and satisfaction to the patient, the relief from pressure has not been enough to allow a return of motion in the legs, and no patient operated on has yet been able to get up and about.

6. The history of the *operative treatment* in the management of Pott's disease includes the attempts made to stiffen the spine by placing steel bars under the skin along either side of the spinous process. This was a failure. Later, in the history of the operative treatment, came the operation performed by Dr. Albee of placing a piece of bone, usually taken from the tibia or a rib between the split spinous processes; next the operation of Hibbs, whose object is to ankylose the diseased vertebrae by utilization of the spinous processes stripped of their periosteum and the curretting of the articular processes. These operations, of course, do not attempt to touch the process of the disease. Indeed, they keep far from the disease, and their only object is to do exactly what the immobilization by the cast or the metal brace does, but to do it more perfectly. This under-the-skin fixation of the diseased vertebrae is a most valuable asset in the treatment, especially in those cases that desire to cut down the duration of treatment, and in those cases where mechanical fixation is difficult to maintain in place. Each of these operations fills an important place in the treatment of caries of the spine, and as the technique improves their place will become more and more important among the methods of treatment.

Figure 2. Child with tubercular spine on gas pipe frame with extensions on chin, occiput and feet.

On examination of skeletons from the tuberculous spine cases in which the healing has taken place by the processes of nature, I am struck frequently with the fact that there is often firm ankylosis between the laminae and spinous processes of one vertebrae with another, where the periosteum of these parts has been worn away by friction. The surgical work done by Hibbs is a preparation for sound, quick ankylosis of the parts of the bony column. This preparation takes place often without operation, only, however, at the end of a period of time long enough to allow for needless destruction of vertebral

bodies and removal of periosteum by friction. In an operative way, the foundation for this same reparative condition can be made by the surgeon in a very few minutes. Then, with the assistance of nature over a short period of only a few months, we will get a result that it would take nature three or four years to accomplish.

7. The question of cessation of treatment is one which is vexing. When the patient is in support and tenderness has disappeared, parents and children begin to beg for release of the diseased back, and repeated explanation of the pathology of the weakened spine must be made in justification of the continued treatment. Two or three years of rigidly supervised fixation treatment is necessary in most of the cases; in the severe ones, one or two years more are necessary when successful operative aid to support has not been added. The treatment may be shortened considerably by these operations, often reducing the time two-thirds. My cases, however, require mechanical support after the operation, even when fracture or absorption of the bony graft has not taken place. The absence of tenderness or pain does not aid in judging when the support should be removed. Increased bony fixation judged from examination of the kyphosis, and the absence of rigidity of muscles, shows the result of efficient treatment, but does not always indicate that the support should be removed. When the case was one of mild degree at the beginning of treatment, roentgenogram showing only slight loss of bone, and if the treatment has progressed for two years satisfactorily and examination shows not only no signs of active disease, but every indication of firm callous support, the brace or jacket is removed. This must be done by degrees. At first, it is best to remove it for the night only, taking it from the back and replacing it while the patient is prone. Later, the support may be removed and replaced while in a sitting position. The next step is to remove the support for a period during the afternoon, as well as for the night. Gradually, in this way, over a period of a few months, the support should be put aside entirely. It is wise, however, to continue supervision of the case at irregular intervals for a period of months after all support is discarded and the back pronounced cured.

INCIPIENT PHTHISIS IN CHILDHOOD.*

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The subject assigned to me is of extreme importance to every medical man, and of still greater importance to the health of the community, of which we are the appointed guardians.

I have limited my talk entirely to tuberculosis in childhood, the most important one of the respiratory diseases, and hope the few minutes I shall take up of your time and the few points which I shall endeavor to bring out will compensate you for omitting the non-tuberculous respiratory diseases. I leave them for some future time when they may be made the topic by some one among you more familiar than I with their elucidation.

The subject of tuberculosis in childhood is in itself so immense that in the few minutes allotted me I shall only cover a few important points in the etiology, pathology, symptomatology and treatment.

Etiology: The specific cause as you know is the bacillus tuberculosis.

PREDISPOSING FACTORS.

Heredity: That there are undisputed cases of placental infection in utero cannot be denied. According to the students of Warthin, Curie, it is perhaps a little more frequent than heretofore supposed. Suffice to say, however, that its occurrence is rare and from a practical point of view may be entirely dismissed.

The question of hereditary tendency, however, is universally accepted, not so much the hereditary predisposition to tuberculosis itself as the inherited lowered resistance of the organism, the result of hygienic and sociologic conditions over which the organism has no control. The theory of hereditary predisposition to tuberculosis itself probably can be discarded entirely, as more frequently a partial or relative immunity is conferred to the offspring by a tuberculous mother than the reverse. Turban, Solly & King have shown that tuberculosis in patients who give a history of tuberculosis among the parents, runs a more chronic course, and frequently is a milder grade of infection. And this is what we ought to expect. The gradual syphilization of the race

*Read before a meeting of the School Health Officers of the City of Chicago, Feb. 15, 1915.

since the middle ages has conferred upon the human race a partial immunity, which accounts for the milder infection of the present day as compared to the severe scourge which befell the people of Europe when syphilis was first brought there. It is also observed in orphan asylums that no greater proportion of tuberculosis develops among children of tubercular ancestry than in those without it.[1]

Hygienic Conditions: The important part played by fresh air is universally recognized, not only by the medical profession, but by the laity as well. The admirable tendency of the public in general to develop fresh air babies, fresh air children, the increasing number of sleeping porches being built, etc., can only be commended and encouraged.

Sociologic Conditions: That tuberculosis is only a disease of the poor has been disproven so many times by its occurrence among the well-to-do, that further evidence is unnecessary, but that in the majority of cases, poverty, with the close contact resulting from overcrowding in small rooms, and its bedfellow, ignorance, are responsible for the propagation of the disease, cannot be questioned. Our tuberculosis clinics in the large cities, here and abroad, have proven it repeatedly that given an open case of tuberculosis in the mother not one member of her offspring will escape infection. Lack of knowledge of the nature of tuberculosis, of its infectiousness, of its curability in the early stages, of the existence of special public institutions for the treatment of the consumptive, is the cause of the much greater toll of life among the poor. Lack of means for healthful existence, however, is perhaps the greatest single cause for the spread of the disease. Those of you who have had experience in social work or in Municipal Tuberculosis Sanitarium and Dispensary work know that in the majority of cases that come to the clinics there is a dire need of the ordinary necessaries of life, much less sufficient to put an effective anti-tuberculosis fight into operation.

Age of Infection: This interests us considerably. When we realize that the majority of cases of tuberculosis die in early adult life, between twenty and forty years of age, and the chronic nature of the disease, and when we further realize that the age between twenty and forty is the child rearing period, it is very evident that the offspring in such cases are very likely to become infected early in life. And such is the case. This is not only proven by the numerous instances of entire family infections, but by the increasing number of positive Von Pirquet reactions obtainable among older children. Excluding the few cases of direct exposure to infection in later life, it is probably safe to say that most cases of tuberculosis are infected before the fifteenth year of life, and as we are the guardians of the children under that age, it ought to be of paramount interest to us to learn to discover these cases and institute measures to prevent *prolonged re-infection* by placing them under appropriate supervision.

METHODS OF ENTRANCE INTO THE ORGANISM.

Pulmonary Tuberculosis: That the tubercle bacillus enters the organism by way of the respiratory tract has been gradually accepted as being the most frequent manner. This, however, has been over-estimated. The postulate of Koch that since no primary lesion can be found in the intestinal tract or in the mesenteric lymph glands, we cannot suppose that infection by way of the digestive route is at all common, is untenable. If it were, our work in the inspection of cattle would all be wasted energy. Different authors estimate the undoubted cases of intestinal infection as varying from three to thirty-five per cent.[2] The infection by way of the respiratory tract deserves some consideration. Although bacilli may reach the smaller bronchi and alveoli of lung by direct inhalation; it is by no means very common that this does occur since the air filters in the nose and throat and the ciliary barrier of the bronchi prevent this rather effectively. A much shorter route is open to the bacteria whether they be inhaled or introduced into the mouth with food, and this by way of diseased tonsils, inflamed nasal mucosa, and diseased gums surrounding carious teeth. The early glandular involvement at the anterior lateral surface of the neck bears evidence of that fact.

Pathology: Here the title of my paper, "Incipient Phthisis," conflicts a little with my conception of the disease. According to most authorities, and especially Turban, whose classification has been accepted by the International

1. Raveuel, chap. 1, in Klebs on Tuberculosis.

2. Raveuel, chap. 1, in Klebs on Tuberculosis.

Tuberculosis Congress, tuberculosis is classified into three stages:

1. Glandular.
2. Pulmonary without breaking down of tissue.
3. Pulmonary with breaking down of tissue or excavation, and visceral.

Thus you will see that in discussing incipient phthisis, we are discussing the second stage of a disease without having paid any attention to the primary or glandular stage. Whether infection has occurred by way of the respiratory tract or by way of the intestinal tract, the glandular involvement adjacent to the site of infection is the most frequent site of development. In the respiratory method of infection, the cervical lymph nodes, especially the anterior, become enlarged successively until within a short time we have the entire chain enlarged. This enlargement, however, is not necessarily due entirely to tubercle, the soil may have been prepared by previous infection of the tonsil, nasal mucosa, etc. Under continued reinfection, and this I wish to emphasize particularly *under continued reinfection*, it soon, however, becomes generalized, involving peribronchial, bronchial, axillary, retroperitoneal or inguinal lymph glands. It is but a step from the lymphatic to the circulatory system, and whether the poor circulation of the pulmonary apices offers favorable ground for the pulmonary development, or whether the pulmonary infection occurs from contiguous bronchial glands cannot be positively stated. Both probably occur. At any rate the third and fourth order of bronchi at about the level of the clavicle or immediately below it, especially posteriorly, are the sites which first become demonstrable as tuberculous foci.

Diagnosis.—The standard text-book description of the tuberculous child is about as follows: An undernourished, anemic child, with a rather clammy skin, dry hair, poor teeth, enlarged cervical glands; a child outdistanced at play, easily fatigued, and on account of repeated minor ailments behind in studies.

This stereotyped description holds good for a group of cases in which the majority of symptoms described are due not to the tuberculous infection, but to the insufficient or poor food, improper hygiene, and associated oral or nasal abnormalties. I venture to say that there are three times as many cases of poorly nourished and anemic children not due to tuberculosis as there are in which these symptoms are due to tuberculosis. Those of you, who are engaged in the poorer districts of our city full well know that one-quarter or one-third of the school population presents symptoms similar to the above and not all by far are tuberculous.

In the better neighborhoods of our city, the tuberculous child is frequently a healthy, rugged looking individual with a flushed, fresh air cheek, well-nourished, alert in school, capable at play, presenting no evidence except perhaps a few enlarged cervical glands and a slightly rapid pulse as proof of his infection. Not stinted by lack of nourishment nor handicapped by poor hygiene, he has developed normally, and it is only after prolonged exposure to reinfection that he gradually falls behind his fellow. How then are we to detect such an individual with our hurried and limited examination which we are permitted to make? Right here I want to make a statement. Under our present system, without consent to strip the child and under the stress of fifty physical examinations demanded a week, it ought not to be requested of us to make a positive diagnosis of tuberculosis. It will not only save humiliation for the Department as a whole, but it will save our reputation among our fellow-practitioners who look askance at every diagnosis made by a school physician, and who themselves have not the courage nor the inclination to make a diagnosis of tuberculosis themselves in many instances.

There are, however, a few points which most of you are very familiar with, and these are the enlargement of the anterior cervical glands, the chain of glands, the enlarged axillary glands, the bluish sclera, the muscle spasm over the apices at the back of the neck, the increased elasticity of the skin over the older foci due to the fat absorption and the spasm of the skin muscles over the acutely inflamed area, the increased pulse rate, the vasomotor instability, etc. These points are all valuable, but of much greater importance is the family history. The above mentioned points do not make a diagnosis, but they do tempt us to further inquiry in regard to the family of the child. It is here where the important part of the school nurse comes in. We can have her inquire into the family history, whether any member has

had consumption or is under treatment, or whether the living conditions of the family are responsible for the anemia, undernourishment of the child, in short, for the pathology present. When we consider that there are perhaps 100,000 cases of tuberculosis in this city, we can readily see that the chance for infection is very great for the child, but to make the diagnosis in the child early enough to prevent it becoming dangerous, it is necessary to have his family history. This, I believe, is the most important point in the diagnosis. We must rely upon our nurse to get at the facts, and if one of the parents have tuberculosis in any form, we ought to conclude from that alone that the child is infected. This is a bit radical, but the error will be on the side of "Safety First."

From a practical point of view, the diagnosis of tuberculosis in schools ought to be handled differently from what it is today.

Realizing that it is impossible for the ordinary school health officer to make a positive diagnosis upon which the Health Department can stand and recommend treatment, I wish to make the following suggestion:

All suspected cases picked out by the health officer ought to be carefully investigated by the school nurse. A careful family history should be obtained, including the hygienic conditions of the dwelling, the financial condition of the family, the intelligence of the family, and above all, whether any member has, has had, or may have a tuberculous infection. These cases ought then be brought to a central clearing house where men competent to make a diagnosis can examine them, make all tests necessary, and arrive at a definite diagnosis. Or the central clearing house may go to the patient; a few men especially trained may each visit a certain group of schools at intervals, and examine all the children picked out for them. Assisted by one or two capable nurses, and seeing each patient perhaps several times, a positive diagnosis ought to be reached in each case. The latter method, I believe to be preferable, producing less alarm among the parents, who in many instances refuse to let their children be taken to hospitals and dispensaries, even for examination. Fortified with a positive diagnosis, the Health Department can take steps necessary and recommend treatment for the individual case, and also endeavor to provide conditions under which children should receive their education.

Treatment.—Before we consider the treatment of the individual we ought to consider first the treatment of the community, to rid the community of tuberculosis, and the measures necessary for its accomplishment. Aside from the economic conditions, such as wages, housing, quarantine for infectious cases, etc., a discussion of which we cannot enter into here, there are several other points which are of distinct advantage to us and surely to the individual afflicted or exposed. These are:

1. A closer co-operation between the Municipal Tuberculosis Sanitarium and Dispensaries and the Health Department. The school physician ought to be notified of every case of tuberculosis occurring in families, the children of which are attending any of his schools.

2. The general profession ought to be urged to report every case of tuberculosis early, so that effective measures for combating the disease among the children in that family may be taken immediately.

3. A closer co-operation between the school nurse and the school physician ought to exist; one nurse to each physician, and always present when the doctor makes his visits to investigate any case immediately at his suggestion.

4. Compulsory disinfection of premises after death or removal of a consumptive. This, I believe, is a fact the importance of which is underestimated.

As to the treatment of the individual, I have only a few words to say:

The excellent results obtained in the fresh air schools and school rooms, established under the Elizabeth McCormick Fund of this city, ought to serve as a stimulus to establish more of their kind. This ought not to be a private enterprise, but ought to be done by the school board under supervision of the Department of Health. Sufficient room ought to be established in each school to accommodate all children from families in which a case of tuberculosis, even in its incipiency, exists.

Private enterprises ought to devote their attention and money to the larger problem of proper housing conditions, to the treatment of second and third stage cases among the poor, and

providing for families whose bread-winners are stricken with the disease.

Every active case of tuberculosis in the second and third stages ought to be a sanitarium case until arrested and free from bacilli-containing sputum and sufficient sanitarium beds ought to be provided for their use. It is rather interesting to note that in a city of 2,500,000 people there is not an institution devoted to the treatment of consumption where a physician may treat private cases, under conditions such as the case demands. And perhaps the greatest problem befalls our government and business enterprises, and that is to secure a wage to employes on which they can live under proper hygienic and dietic conditions, and not merely struggle to exist.

One more important point: A greater hope and perhaps more feasible than any is the immunization of children by Von Ruck's vaccine. It seems to be proven that this is not only possible, but is actually being accomplished by Von Ruck. In the city of Asheville, he has immunized about 2,000 pupils, including a great many with glandular tuberculosis, and also a few with incipient pulmonary lesions. At subsequent examination their blood was found not only immune to tuberculosis but the glandular and incipient pulmonary lesions had receded entirely. In a healthy individual, one full injection is sufficient, whereas in infected cases, two to five fractional doses may be required to procure the desired effect. The length of the immunity is not definitely known, but several cases immunized seven years ago are still immune. This work, while it was not approved by the U. S. Public Health Service,[3] for reasons best known to themselves, has nevertheless been confirmed by several men of international reputation abroad, such as Sir Almroth Wright,[4] and Misch and Leschke.[5]

I sincerely believe and hope that the day will come within the near future when every child upon entering school will be immunized against tuberculosis, just as it is now against smallpox, and if Von Ruck has what he faithfully believes he has, it will add only another name to the golden category of triumphs of American medicine.

3772 North Clark St., Chicago, Ill.

3. Jour. A. M. A., 1914.

4. Special cable dispatch to Karl von Ruck in "Experiences in Prophylactic and Therapeutic Immigration Against Tuberculosis," by Karl von Ruck, Dec. 2, 1914.

5. Breitäge zur Klinik der Tuberkulose, 1914, XXXI, 335.

TREATMENT OF LARYNGEAL TUBERCULOSIS.

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At the present time the treatment of laryngeal tuberculosis is regarded by many as a failure and by others as an attempt at euthanasia, but with the progress of the last few years it has become better understood and therapeutic measures have been instituted with success in a large per cent of cases formerly abandoned as hopeless.

The fact that numerous "specifics" have been found wanting has been looked upon by the less studious as a measure of the value of all treatment, and therefore, where real progress has been made it requires some dissemination to bring this to our common knowledge.

Tuberculosis of the larynx is so frequently a sequel of apical disease that some of the profession have refused to look for any other causes. To these it might be well to mention that about four per cent of tonsils examined microscopically on section show the acid-fast bacilli, and that tuberculosis of the adenoids is not an unknown condition.

Primary infection of the larynx is rare, but cases have shown no other complication and are so diagnosed correctly. This is true with cases arising in dust-laden districts where the disease is endemic.

Treatment of the disease depends on numerous conditions and involves the intelligent use of numerous factors, any one of which may vitiate the results and render unfavorable a prognosis otherwise guardedly hopeful.

The treatment in any special case depends on the pathological conditions found in the larynx and in other parts of the body, but on the whole it should be divided into:

a. Hygienic. The habit of sleeping in poorly ventilated rooms or of crowding too many patients into one sleeping room, the habit of sitting in a closed room all day, rooms in which the oxygen is consumed by a stove and lamp, etc., etc., are all to be explained to the family and insistence that proper ventilation be instituted both by day and by night.

There are qualities of the air, which make some localities hot-beds for the development of tuberculosis; air that is dust-laden as in many of the smaller cities, this means germ-laden

dust; we should therefore see to it that our patients should have the advantage of a germ-free air. This nature furnishes in high altitudes, in deserts and on the ocean.

Altitude is a factor in the number of red blood cells per mm., it being known that an altitude of one mile has an average of 1,500,000 more red cells to the cubic millimeter than is the average in localities near the sea level. There is a compensatory increase in the action of the lungs at higher altitudes, which seems to me to be of value in the treatment of tuberculosis of the larynx in that it would seem that more oxygen and better metabolism is in evidence after the development of a greater lung capacity.

Thermal conditions are important in selecting a place for recuperation in tuberculosis, a temperature between 50 and 60 degrees Fahrenheit being the best tonic for incipient cases and a warm temperature being of value only in the exceptional case.

Humidity is another meterological condition which seems to warrant careful consideration in selecting a climate for the sufferer from tuberculosis of the larynx. A moist climate seems to allow the inspired air no possibility of abstracting vapor from the secretions and therefore renders one method of elimination useless and requires the patient to cough and expectorate much more than in a dry climate. This is decidedly a detriment to the welfare of the case of laryngeal involvement.

Sunshine is possibly of greater value than has yet been ascribed to it in the mastery of tuberculous lesions anywhere in the body.

It is a disease which has most victims in the gray-light zone and the greatest number of recoveries in the white-light zones.

Sunshine has not been sufficiently analyzed to state more specifically the active constituents which aid the tuberculous patient, but it is of inestimable value in recovery.

Soil should not be forgotten; if it is a section where the timber has been cut off and the winds blow gales at times there is more irritation to the nose and throat than in timbered localities where dust storms are infrequent, and too, where the soil is laden with irritating chemicals as alkali, the effect is injurious to the throat of the tuberculous subject.

Equability of climate is an important factor in the treatment of tuberculous laryngitis on account of the long-drawn-out recovery in these cases.

I am conscious that certain commercial interests unconsciously color some of our conclusions at times in regard to climatic conditions, which induce earliest recovery from tuberculosis, but in cases where the larynx is involved the most ideal conditions should be sought at once and the patient kept there till the lesions are completely healed and then for his prophylaxis he should be encouraged to remain in the ideal germ-free, stimulating, dry, high country which contributed so much to his recovery. Sad are the stories of those who have returned to the land of contraction of the disease once they find themselves in normal health in the land of their recovery. It means reinfection and another fight with death which ere long claims the mastery.

b. Dietetic treatment is of no small value in the successful treatment of tuberculosis. The old habit of stuffing the patient *ad nauseam* has long since given place to the more rational system of carefully calculating the digestive powers of the patient and rational feeding to meet the indications of same; milk, eggs, whole wheat, fruits, etc., being the chief constituents of the dietetic treatment.

c. Nasal, oral and laryngeal cleanliness requires the elimination of such irritating habits as the use of tobacco and alcohol, the local use of sprays and gargles for the purpose of removing toxic secretions and the relief of cough. Frequently the tonsils are found to be enlarged and red or the pillars are red streaked and then these should be removed.

d. Voice rest is the most important requirement in the treatment of laryngeal tuberculosis; frequently arrest of the process is impossible until the voice is put in absolute rest and no phonation whatever allowed till all symptoms have cleared up. The use of pad and pencil seems slow to the patient and his friends, but it means the most certain relief, it having the same relation to the larynx that a splint bears to a fracture of bone.

e. Medical treatment for the aid of certain constitutional conditions as anemia, loss of weight, massage for the inactive, also locally for the relief of irritation to the larynx, on account of cough, tenacious mucus, etc.

Local treatment is divided into topical, medical and local surgical measures for the improvement of local pathological conditions in contradistinction to treatment of the larynx for local or reflex symptoms of a subjective nature.

For intra-laryngeal lesions in general it should be said that voice changes, weakness of the voice on use, complete loss, or the less radical deviations of huskiness and hoarseness, are the more common symptoms requiring the cessation of phonation.

Treatment of the intra-laryngeal lesions are best administered by inhalations, sprays, pigments, of such medicaments as are of known value in the relief of pain and irritation to mucus surfaces; menthol, eucalyptol, camphor, benzoinol, and stimulating pigments as lactic acids and formalin. The use of guaiacol, creosote, ichthiol and the silver salts have not been so satisfactory in my hands as has the use of formalin in glycerine for topical stimulation of the laryngeal mucus membrane and submucous tissue.

Lactic acid has been used with a certain amount of success in laryngeal lesions and it has caused the arrest of some cases of lighter involvement, but the constant application of from 3 to 5 per cent. formalin in glycerine applied once a day has given better result in all cases whether intra or extra-laryngeal lesion. In addition to the use of the stronger solution of formalin applied on an applicator once a day the throat should be sprayed with a 1 to 2 per cent. solution of the same used in an oil atomizer several times a day.

Edema of the epiglottis, arytenoids, ary-epiglottic folds, or ventricular bands should be scarified with deep punctures, while infiltrative lesions of the same may require the use of the electro-cautery, and ulcers are best treated by the careful and skillful use of the curette. Excrescences and tumors are to be removed by means of appropriate curettement and the use of the punch forceps.

In cases of infiltration of the epiglottis with odynophagia and dysphagia or dyspnea the removal of the epiglottis should be done if after a careful use of the cautery the epiglottis remains as an obstruction to swallowing or acts as the seat of painful reflexes, which sometimes run to the ears, produces cough, or excites excessive secretion, in many cases these are all found in the same case and render deglutition impossible.

Methods of removal: 1. The use of the suspension-apparatus and a long-handled punch-forceps, which removes a part of the epiglottis at a time; this is repeated till as much is removed as is desired. 2. The use of a lingual tonsillotome was the second method employed then later a curved nasal snare was substituted and the epiglottis removed with less hemorrhage, though hemorrhage is not an important complication in these operations.

I have devised an epiglottitone, which has a basket for holding the excised epiglottis from falling down the throat and which will section the organ in a nearly horizontal direction; it is worked on the principle of the La Force adenotome.

The removal of the epiglottis relieves instantly all the reflex pains, the cough, the excessive secretions, and the obstruction to swallowing.

The operation of epiglottomy, if I may be pardoned for the use of the word, is not intended to act in a curative manner, usually it extends the life of the patient for a few weeks, sometimes a month or two, but I have not seen any patient survive long whose larynx had reached the stage requiring the removal of the epiglottis.

The objection has been raised as to the ability of the patient to swallow without aspiration of food and drink into the larynx, and in reply I wish to state that I have seen numbers of patients who could not swallow even liquids with a cocainized epiglottis, take both liquid and solid food within an hour after removal of the epiglottis. This being done in comparative comfort.

In the earlier operations Lockard had his patients lie face downward on a couch in order to drink without aspiration, but I think this position is of psychic value only and that the patient can eat or drink as safely sitting upright as in recumbent position.

This has reopened the question of the function of the epiglottis in deglutition which we pass on to the physiologists for settlement.

The amputation wound heals with remarkable rapidity even in granulation tissue and should be treated in the same manner as other lesions of the larynx, that is to say with sprays and applications of formalin-glycerine of weaker strength.

Ulcers and miliary tubercles of the larynx should be treated with formalin-glycerine solutions of stronger concentration, from 3 to 5 per cent. and they usually clear the epiglottis within two or three weeks.

ILLUSTRATIVE CASES.

Case 1. Mrs. E. I., aged 20 years, began to suffer decline about two years ago. Apparently tuberculosis was not even suspected by men of good reputation in St. Louis. Was operated on for appendicitis in the early part of January of the present year. Recuperation slow and unsatisfactory, a diagnostic dose of tuberculin was administered to determine the presence of tuberculosis with the result that there was a retarded reaction but a very stormy one, which within a few days later manifested in the throat as excessive secretion, cough, painful duglutition and a sense of tumor in the pharynx, Feb. 2. At this time I was called and found the epiglottis studded with miliary tubercules and some thickening of it and of the ventricular bands. I used formalin-glycerine solution, 3 per cent daily, and ordered an aqueous solution, 1 per cent of the same as spray three times a day, and the local application of an oily solution of menthol, thymol, camphor, eucolyptus and benzoinol in order to allay the pain.

The tubercles ulcerated and healed within two weeks, leaving pits that looked like the pits of smallpox. The throat became normal in appearance, except for this and duglutition could be accomplished with comfort. I made a diagnosis of miliary tuberculosis, from which the patient died early in April, but there were no disturbances of the throat during the latter part of her illness.

Case 2. J. E. H., aged 31 years, salesman. About the first of November, 1914, noticed that he had some huskiness of the voice with a slight cough. Diagnosis of acute laryngitis was made and a spray was ordered which gave temporary relief; treatment was discontinued with return of the symptoms and this was again treated with alkaline sprays but did not effect relief as in the earlier treatment. Dec. 29 he called on me and the throat showed only an acute laryngitis with swollen right arytenoid and red cords.

A solution of 1 per cent formalin in water was ordered t. i. d. by atomizer and a local application of 5 per cent formalin-glycerine on a laryngeal applicator. On account of the necessity of using his voice, I strongly recommended a change of employment to that of bookkeeper or something else which would allow the complete rest of his voice, but under the treatment the lesions are looking better and the subjective symptoms are not so distressing.

Case 3. R. W., aged 33 years, telegraph operator. Left vocal cord a dull red with ulceration between middle and posterior third with extension up on the ventricular band of same side which appears to be very thick. Right cord has ulceration opposite that of the left but the color of the rest of the cord is more nearly normal.

This case was being treated with tuberculin by another physician who desired me to give the local laryngeal treatment, which consists of the application of the 5 per cent formalin-glygerine solution to the larynx twice a week, on account of his living in another city, and the use of a 3 per cent solution of the same t. i. d. in an oil atomizer. After the first month the condition has made a steady gain in function and appearance, though the patient is still hoarse when speaking.

Case 4. Mrs. C. I. J., aged 50 years, Complains of voice fatigue within short conversations. Has a cough, but no expectoration, tuberculin reaction positive, treatment same as in the other cases with a gradual improvement.

Case 5. Mrs. Wm. McG., aged 35 years. When called to see this case she complained of radiating pains to the ears, abundant secretion in the throat, cough and tickling; she had been cocainized to take food and this had become unavailing.

Examination showed deep ulceration on left side of larynx involving the cord, ventricular band and aryepiglottic fold and complete erosion of the left side of the epiglottis. The remaining part of the epiglottis was thickened and showed superficial ulcers on crest and on posterior surface.

Treatment in this case was then directed to the removal of the offending epiglottis, which I did with a snare having a curved tip.

The relief was almost immediate and complete. She had reached the stage when starvation under the most painful conditions was imminent and the epiglottis operation saved her untold suffering and prolonged her life for six weeks.

Case 6. T. O. H., aged 27 years, farmer. Two years ago began to notice a decline in his health but without pulmonary signs, was advised to go to the Rocky mountain region for his health; he remained in the west for about 18 months when he returned to Illinois much improved last fall. Within a month he developed a sore throat which did not clear up under the routine treatment. Repeated examinations failed to reveal any pulmonary lesions, the throat became worse; to the soreness was added hoarseness and later a decided odynophagia which prevented swallowing anything and at this point I was sent for. March 12, examination showed temperature 102, pulse 120, blood pressure 120; still no pulmonary signs obtainable.

The right tonsil was eaten away to the base on its anterior side in an undermined and ragged manner, typical of tuberculous lesions. The vocal cords were invisible, due to the infiltration of the epiglottis and thickened ventricular bands; these were covered with ulcers from the broken down tubercles. Reflex pains radiated to the ears and locally the pains were intolerable on the slightest movement of the muscles in swallowing.

I cocainized the epiglottis and amputated it with a cold wire snare and saw the patient drink in com-

parative comfort the first liquids for three days.

This patient lived a month and ten days.

In primary lesions of the larynx I should recommend the removal of the epiglottis as soon as it became certain that it is involved to the extent that local medical treatment is unable to secure the function of swallowing in comfort. I am sure that such procedure will prolong the life and comfort of the patient.

SYMPOSIUM ON TUBERCULOSIS.*

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Mr. President, members of Clark County Medical Society, it gives me great pleasure to be with you again to discuss one of the most interesting diseases of the day, namely tuberculosis.

As a definition tuberculosis is an infective disease due to the deposition and multiplication of tubercle bacilli in the tissues of the body. A tubercle is a non-vascular infective focus, appearing to the unaided vision as a semitransparent gray or yellowish mass the size of a mustard seed. The tubercle bacillus was discovered by Robert Koch in 1882. It is a little rod with a length about equal to one-half of a red blood cell. It is nonmotile, does not form spores, and requires oxygen to grow, but it may obtain oxygen from body-cells or fluids. It exists in all tuberculous lesions, and the more active the process the greater their numbers. Koch in 1891 asserted that the bacillus of human tuberculosis differs from the bovine type; that human tuberculosis cannot be transmitted to cattle at all, and that it is so difficult to transfer bovine tuberculosis to the human being that the danger from infected cattle is trivial and may be disregarded. Ravenel and others have positively opposed this view of Koch's, and there has been reported what appears to be undoubted cases of the transference of tuberculosis from animals to man. There is still dispute upon this point, but most writers believe that bovine tuberculosis and human tuberculosis are essentially the same, although bacilli present temporary differences due to altered environment. The bacilli of bovine tuberculosis are certainly far less dangerous to man than are the bacilli of human tuberculosis, and the bacilli of human tuberculosis are vastly less dangerous to cattle than are the bacilli of bovine tuberculosis. Human bacilli introduced into cattle may produce chronic lesions, but they are always non-progressive. Nocard reports two cases of individuals who wounded themselves while cutting the flesh of tuberculous cattle. Both developed generalized lesions and died. Ravenel strongly opposes the view of Koch and maintains that the bacillus of bovine tuberculosis is highly pathogenic to man. The same author has reported four cases of undoubted inoculation in the hands of veterinarians. The entire question is of vast importance, for, if Koch is right in his views then there is practically no danger of eating tuberculous meat or drinking tuberculous milk. Most observers endorse the words of the British Commission of 1904 in which they maintain that bovine tuberculosis can be communicated to man.

The bacilli of bovine tuberculosis, when they find lodgment in human tissues, are apt to produce local lesions and seldom disseminate, and vice versa. It has been proved that many cases of tuberculous adenitis in children, but only 3 per cent. in adults, are due to bovine tuberculosis; 50 per cent. of cases of abdominal tuberculosis in children and 20 per cent. in adults are due to the bovine bacillus.

Some bone cases and a considerable number of joint cases in children depend upon the bovine bacilli, but very few in adults are so caused. Pulmonary tuberculosis very seldom depends upon the bovine organisms. It is thus clear that human infection with bovine bacilli is most common in the young, and that surgical tuberculosis is far more apt to have such origin than other forms. Tubercle bacilli from an infected individual may get into the atmosphere from the urine, the sputum, the feces, the sweat, the milk, caseous or purulent material. The infected area itself is usually the direct source of the bacteria from a given case of tuberculosis, but this is not invariably so; for a tuberculous women with a healthy mammary gland may secrete milk that contains tubercle bacilli; a consumptive free from genito-urinary tuberculosis may occasionally pass urine containing bacilli; a cow may give tuberculous milk when the udder is not diseased.

An individual may acquire tuberculosis by inhaling tuberculous material, by swallowing tu-

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berculous material, and by inoculation with tuberculous material. Infection of the lungs may be brought about by the inhalation of dried tubercular sputum, and ingestion tuberculosis may follow the eating of tuberculous meat, the drinking of tuberculous milk, or the consumption of uncooked articles on which tubercle bacilli have gathered. It has been shown that the lacteals may take up tubercle bacilli from the intestine, even if there is no intestinal lesion; and that the bacilli can pass through the thoracic duct and into the blood, and lodge in some tissue, particularly the pulmonary tissue, so inducing tuberculosis. They are apt to lodge at any point of least resistance; and if not caught up in the lungs, will tend to be arrested in an irritated gland or in some region that has been the seat of some recent injury, e. g., in an epiphysis that has been bruised.

The diagnosis of early pulmonary tuberculosis in this discussion may be defined as the recognition of a focus of incipient tubercular inflammation, and also recognition of the first advances of a recrudescence of an arrested or latent lesion.

It is axiomatic in tuberculosis that the greater the number of early diagnoses, the greater will be the number of recoveries; conversely, it may or may not be a hyperbole to state that the presence of advanced tuberculosis presupposes failure of early diagnosis, allowing of course for the virulence of the infection and the fighting qualities of the patient's organism. However, it does not require the force of exaggeration to emphasize the all too well recognized fact that in a most pitiably deplorable number of instances lives are lost because the physician has not made himself familiar with the easily elicited signs of beginning tubercular infection. Advanced tuberculosis may also mean neglect upon the part of the medical advisor to enforce a rigid regime of treatment at first. Misdirected pity too often compromises judgment.

Incipient tuberculosis does not manifest itself by any one pathogmonic sign as does the advanced disease by the presence of Koch's bacillus in the sputum, but its recognition depends upon the scrutiny of a complex picture the parts of which are with painstaking care elaborated from the history of the patient and his associates, the story of his former life, the various subjective symptoms of which he may be aware and the physical changes produced by his malady. In a word, the secret of early diagnosis depends upon adherence to a systematic scheme of case taking and then a consideration of the patient's rational symptoms and the physical signs.

A word about tuberculosis in children. The work of Von Pirquet laid the foundation for the now generally accepted statement that by the age of sixteen years practically all children have had tuberculosis, so disease of the adult is very likely to be a lighting up of a previous infection which an attenuated state of the individual's resistance or a reinfection by repeated contact with other tubercular individuals and the onslaught of overwhelming numbers of bacilli has brought about. Such lowering of resistance frequently follows measles or whooping cough in children or typhoid, overfatigue, etc., in the adult. The consideration of tuberculosis in children means particularly a search for glandular tuberculosis, especially swelling of the glands at the base of the lung and in the mesentery.

The more we study the pathology of tuberculosis the more firmly we are convinced that there is a time when every case is almost a curable case if only the proper means are instituted under the proper conditions.

Most of the exceptions to this statement are found in the early cases of tuberculosis produced by an exceptionally virulent strain of the bacillus or by the inoculation of enormous numbers of bacilli. Under all other conditions, after the infection occurs, the organism regains a temporary advantage, which, if followed up, could usually be turned to a lasting result. If ever we are to make headway in the treatment of tuberculosis it must come through the recognition and understanding of its early pathology. We must emphasize the latent stage of the disease. We have been so thoroughly taught that syphilis may be present without producing symptoms and yet be a dangerous disease, that this knowledge is common property. So must the same fact be impressed upon the medical profession as regards tuberculosis.

The earliest form of tuberculosis, as we find it pathologically, is that which affects the lymphatic glands, the bacilli having passed through the tissues, usually the mucous membrane of the air passages or alimentary canal, without producing lesions, or producing small lesions, as

Gohn has recently shown to be the case in the lungs. This lymphatic form of tuberculosis, affecting chiefly the glands of the large cavities of the body, cannot be diagnosed by physical examination nor x-ray unless the glands are of considerable size, so it is not safe to rely upon such procedures; neither do they produce unmistakable clinical symptoms.

Fortunately, the tuberculin test can be employed and the results obtained by it can be relied upon to give evidence of the presence of tuberculosis under these circumstances. Of course it does not locate the lesion.

Of the various methods of employing the tuberculin test I prefer the cutaneous as suggested by Von Pirquet, because of its simplicity and ease of administration, although I am inclined to believe that the subcutaneous is the most reliable of all. The interpretation of the Von Pirquet skin reaction is very important. I know that it is usually said that the Von Pirquet skin test is of no value in adults, but Pottenger says it is of great value and he also says it is the only test that he relies upon. The statement of the worthlessness of the test in adults is based upon the fact that a very large percentage of adults will react to tuberculin owing to the fact that a very large percentage of them have been infected during their lives. I do not think that much is to be gained by a simple reaction; but, if the character of the reaction is taken into account and the time of the reactions, appearance and the course the reaction takes, I believe that we can derive very important information from this test. According to our experience, a marked reaction to the skin test which comes on promptly within a very few hours after the inoculation and increases, reaching its maximum within the first twenty-four hours, I should say, is very indicative of an active lesion. Still a slight reaction on the other hand or one which comes on slowly, beginning to show late in the twenty-four hours and then increasing, reaching its maximum the second day or even later; most authorities consider this as an inactive stage. I am inclined to consider that much is to be gained by the character of the reaction. A very faint reaction is more apt to be due to a focus that is not very active, while a frank reaction is more apt to be indicative of an active lesion. Of course there are conditions that a patient is under which will not react, such as cachexia, and when a patient is recovering or suffering from numerous infectious diseases such as measles, scarlet fever, diphtheria, spinal meningitis, but notably measles. But if these exceptions are kept in mind I believe that we can interpret this reaction in such a manner as to furnish us valuable information. This interpretation of the tuberculin test has tallied with most authors based on the physical examination, the muscle signs and the clinical history. In my statements regarding the reliability of evidence based upon the character of the tuberculin reaction I am considering only early tuberculosis where the test is considered necessary to confirm or disprove the diagnosis which has been based on other examinations. This must not be expected to hold true in advanced tuberculosis. Further I would say that these statements apply to those patients who are in fairly good physical condition rather than those who are badly run down. In several instances we have found patients who were badly run down, weak, anemic, with loss of flesh, who, although suffering from active tuberculosis, reacted only slightly to the tuberculin test.

When it has been determined that a patient is suffering from active tuberculosis, I can say, without fear of contradiction, that such a patient should be kept under a physician's surveillance until healed. I believe the same should be done in instances of latent tuberculosis, although this statement, I fear, will provoke controversy. Why should we treat the tuberculous patient differently from other patients? Why should we not be fair to him and to our profession and give him the benefit of our best knowledge? The members of the medical profession are constantly looking out for diagnosis and treatment of latent syphilis; for the prompt recognition and operation of chronic or quiescent appendicitis; for the recognition of symptoms which are supposed to foreshadow arteriosclerosis or a chronic nephritis. Then why should they not treat latent tuberculosis with the same degree of seriousness? Whether our profession agrees with me on the necessity of the treatment of latent tuberculosis or not I am sure that it will recognize the value of the knowledge to be gained by knowing that latent tuberculosis is present, especially in children who are not developing properly. The parent or the physician having such knowledge re-

garding a child would unquestionably be more careful with him and be more prone to suspect active symptoms of clinical tuberculosis earlier than when such knowledge did not exist.

Not only have we failed to give the lymphatic form of tuberculosis the attention which from its importance it deserves, but we have even been negligent in our treatment of it when it spreads from the lymphatic system and attacks other parts. After it has thus extended it often assumes a latent form again, producing no symptoms that we have learned to recognize until the process has become more or less active. The presence of these secondary foci may be determined when comparatively small by careful examination, provided they produce recognizable symptoms which direct the attention to the parts affected. It is not uncommon after these new foci have been formed for the process to again assume a state of quiescence or latency and again assume such a condition that the tuberculin test is our most dependable method of obtaining a judgment.

It can be seen from this discussion that there is much that can be done towards recognizing the early infection and preventing clinical tuberculosis that is not being done. Our attention should be turned to the early infection, the latent condition and the early extensions of this disease that we may prevent the advanced disease that we are so often fighting now. The diagnosis of pulmonary tuberculosis has now reached such a degree of accuracy that nearly all lesions can be diagnosed while still small and before the tubercles break down and produce bacillus bearing sputum. That only a small proportion are so recognized is proof that the patient suffering from tuberculosis is not getting the best that we as a profession are able to give. The blame of this is not all to be placed on the profession of medicine either, but our just proportion of blame is far more than it has any right to be. We recognize that the patient is often slow in presenting for examination when early symptoms develop. We also know that he is very prone to question an early diagnosis when made; but this does not free our consciences from the countless early cases of active tuberculosis that we as a profession are daily overlooking. It is our duty as a profession to diagnose correctly nearly all cases of incipient tuberculosis that consult us. We may not be able to do it individually, but collectively we can and must. The laymen who place their confidence in us have a right to demand this, and we, as a profession, are abundantly able to give it.

The clinical symptoms are sufficient, in most instances, to cause tuberculosis to be suspected. When suspected we have other methods of diagnosis by which we can almost positively form a correct opinion. If the attending physician is not sufficiently conversant with them, fortunately, now, we have men in every large community and in many small communities, who are capable of giving an accurate opinion. My plea for the more general use of the consultant applies equally in every branch of medicine. We too often fail to give our best services to a patient because we fail to recognize our own limitations, then fail to call assistance at the time when assistance could be of some avail.

I wish to mention a few of the more common symptoms complained of by patients suffering from early active tuberculosis. While all are rarely present, usually two or more of the following will be: Malaise, a feeling of being run down, lack of endurance, frequent and protracted colds, hoarseness not due to laryngeal disease, slight indigestion with loss of a little weight, aching between shoulders, tickling in the larynx causing clearing of throat, or dry hacking cough, night sweats, slight rise of temperature, spitting of blood, and pleurisy. Any combination of two or more of these should make the physician think of tuberculosis and request that it be eliminated before a definite diagnosis be made. A spitting of blood or pleurisy should be considered as indicating tuberculosis unless definitely proven otherwise.

It is probable that an explanation of the etiological factors in the above symptoms might be of some value in facilitating early diagnosis. I believe that the common early symptoms which I have enumerated may be divided into three groups based upon their etiology.

Tuberculin Toxins	Hoarseness
Malaise	Indigestion
Feeling of being run down	Chest pains, especially in shoulders
Lack of endurance	Tickling in the larynx
Nervous instability	Cough
Indigestion	

Night sweats Increased pulse rate
Increased pulse rate
Reflex

Tuberculous involvement per se: Frequent and protracted cold. Spitting of blood.

Given a suspicious clinical history the physician should examine any mucus raised from the throat no matter how slight. A 24-hour sample is best and it should be allowed to stand for 24 hours at room temperature, or better, in an incubator so as to become homogenous before examining it. In asking for this do not be deceived by the patient saying that he does not raise anything, or it's only from the throat; examine and see. While bacilli should not be expected regularly, they will be found often enough to pay for the trouble.

The tuberculin test should be applied as a routine measure in the examination of all patients who show signs suspicious of tuberculosis. Every physician who comes in contact with these cases should know how to use this test, or if he does not know he should refer them to someone who does. If a given patient should show a reaction, then it should be determined, according to the plan mentioned above, whether or not the case is active or quiescent.

If possible, in all cases the lesion should be located. The lungs should be examined where tuberculosis is suspected. In reference to the examination of the lungs it seems necessary to still emphasize the necessity of examining the chest bare. While nearly all chest specialists of any note do this, I find many men who, for lack of training and experience, would have far more difficulty in giving an opinion, persist in making chest examinations through clothing.

It would seem needless to say that such an examination is not worth the dollar or two dollars charged for it. One who is not constantly examining for the fine changes in the lung should not be expected to find early tuberculosis by percussion or auscultation. This is no reflection, simply a truth, which must be recognized, for if a man depends on his chest examinations and finds nothing and gives his opinion that tuberculosis is not present, he will do his patient untold harm. It is not an uncommon thing for a physician to suspect clinical tuberculosis by the clinical history, then, when he examines the chest, finding nothing, reverse his opinion. He should not do this. He should not allow his judgment to be overturned and his opinion to be changed by his failure to find the early changes that occur in the lung in pulmonary tuberculosis.

I would suggest two signs: one an old one for which I offer a new explanation, the other a new one which was first described by Dr. Pottenger, as offering great aid in diagnosing early changes in the lung. When these are once appreciated, I feel sure they will greatly facilitate early diagnosis. These signs are lagging of the affected apex and side, and spasms of the muscles covering the apex. Both of these, according to my view, are due to the same etiological factor, a reflex spasm, the production of which is analagous to the spasm of the abdominal muscles in intra-abdominal lesions. They are described as an expression of nature's attempt at defense and are able to produce a considerable degree of rest for the affected side. The reflex is caused by the impulse which is produced by the inflammation in the lung and carried to the cord by the sympathetic fibers.

There it sets up an irritation in the cord which affects the cells from which the motor fibers take their origin, thus producing an irritation of these fibers which go to muscles. The trapezius and sterno-cleido mastoid are the two muscles which best show the spasm. They have a second reflex path through the spinal accessory, fibers of which supply these two muscles and are also found in the vagus.

Experience that those muscles which take their nerve supply from that portion of the cord which receives the impulse from the lung, are disturbed in their equilibrium. This is shown as a contraction or spasm when the inflammation first starts or while it is in a state of activity and in a state of degeneration after the disease becomes chronic. The muscles which are usually disturbed in their action in early apical lesions are the diaphragm, which is supplied by the phrenics which take their origin from the third and fourth and fourth and fifth cervical roots, the scaleni, sterno-cleido mastoideus, trapezius, levator anguli scapulae, all of which receive their nerve supply from the second to fifth cervical segments of the cord, this being the portion of the cord which receives the impulse from the lung.

The spasm of these muscles then is found whenever an inflammation exists in the lung. This spasm may be detected in the muscles covering the apex of the lung both by inspection and palpitation. On inspection oftentimes the sterno-cleido-mastoid, scaleni, and trapezius stand out more prominently than they should and on palpitation are distinctly firmer than normal. The altered function of the diaphragm results in a lagging of the side of the chest involved. This shows itself not only in the lagging of the apex but lagging in the entire chest wall.

In order to determine the condition of the muscles it is necessary to have the patient stripped to the waist and sitting comfortably on a chair with his hands in his lap so that all the muscles are relieved of tension. I believe that these phenomena when once understood by the profession will aid greatly in the early diagnosis of tuberculosis.

Early diagnosis should bring early treatment, and early, intelligent treatment means the cure of a very large percentage of those suffering from clinical tuberculosis. The early treatment of incipient tuberculosis means a favorable result in 70 to 90 per cent. of cases, according to the statistics of various institutions. It is necessary that the medical profession should understand this and give these patients the benefit of treatment at the proper time. The treatment of tuberculosis at best is a tedious and costly process. The cure is slow, and, if the disease becomes advanced, it is very uncertain; and it is attended by so many complications, discouragements and disappointments that it is difficult to keep the patients good long enough to get a favorable result.

It is the duty of physicians and laymen to cooperate thoroughly so that we may give those suffering from this dread disease advantage of the best scientific treatment that we are able to administer during the early stage of this disease when it is possible to restore nearly all to health and usefulness.

As a profession we know a great deal about the prevention of tuberculosis. We feel confident that theoretically it can be prevented, but actually the prevention is taking place very slowly. To be sure the disease is lessening, but it is not lessening to the extent that it should with the knowledge that we possess. With a thorough recognition, however, of the character of tuberculosis, its lymphatic stage, its latent stage, its slow advancement into other parts of the body, and a full recognition of our ability to diagnose the disease before the marked clinical symptoms have appeared, and a thorough comprehension of what can be done in the treatment of early cases, the future should promise a more rapid decrease in morbidity and mortality.

TUBERCULOSIS IN CHILDREN.*

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The function of lymphoid tissue is intimately associated with catabolic processes, and lymph nodes are storehouses for materials that must be destroyed, but if destroyed too rapidly, will produce severe toxic effects. If we remember that the efferent lymph vessels carrying materials to a lymph node are of smaller caliber and enter at the periphery of the gland while the efferent vessels are of larger caliber and leave the gland at the hilus, we may deduce that the tension of the lymph stream entering the lymph node is higher than that leaving the gland. The lymph node acts somewhat after the manner of a reducing valve and part of its function is to slow the lymph stream and to retain in its meshes substances which require time for disintegration.

Hypertrophy is the first sign of overwork. Whenever unusual demands are made upon an organ it increases in size and this is as true of glands as of other organs. Whenever we find an enlarged gland we have one in which the intake is greater than the output and when the overload capacity of the organ has been reached, the work passes on to the next node in the chain and here the process is repeated.

The capacity of the lymphatic system to disintegrate and destroy body cells which have served their purpose in the human economy and must be eliminated is so great that this normal function, seldom, if ever, makes sufficient demands upon the lymph nodes to produce hypertrophy extensive enough to make the glands papable, and it is only when foreign proteid has been introduced requiring the development of new

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enzymes for their disintegration, that it is necessary for these new materials to be temporarily stored. Infectious organisms are the chief foreign substances which find entrance to the human body and whenever we find palpable glands we may reasonably assume infection. Then comes the problem of determining what is the infecting organism, for certain groups of glands, and in general, the regional lymph glands near the avenues of infection are first involved, and serve to guide us in determining the character of the infection.

Of all the infectious organisms which invade the body the tubercle bacillus is by far the most common, so common in fact, that it is generally admitted that practically all children become infected with the tubercle bacillus before the age of fourteen and this is our first thought when we find palpable glands in children.

The study of tuberculosis in children is the study of the period between infection and the first evidence of disease, and it is important that we make careful differentiation between tuberculous infection and tubeculous disease. What do we mean by "infection" and what do we mean by "disease?" If we accept the definition that infection is "the implantation in the tissues of the body of living pathogenic organisms, in such a way as to favor their growth and permit their toxins to injure the tissues," and that disease is "any departure from a state of health," then in tuberculosis, from infection to disease is a long way to go.

Infection may take place in childhood and disease appear in adult life. We have, then, this long period with its various manifestations which has so often been characterized as the "pretubercular stage," a term which we will do well to promptly discard from our literature.

An individual is either tuberculous or he is not. The symptomatology of the pretuberculous condition is a classification of the evidence of pathological changes that have resulted from the damage to the tissues, produced by the toxins of the tubercle bacillus, and these changes are not, as is so often stated in the literature, evidences of physical characteristics which predispose to tuberculosis, but are rather the evidence of the slow development of tuberculous disease.

With a full realization of this truth it is as difficult to accept the theory that certain individuals possess a predisposition to tuberculosis, as it is to accept the idea that certain individuals are predisposed to typhoid, smallpox, or other infectious diseases. The question immediately arises, "Why then do certain families show such a high percentage of morbidity to tuberculosis?" and the answer is "Opportunities for infection." A family with one case of smallpox will show as high a percentage of morbidity as will one with one open case of tuberculosis, with this difference, that the patient with smallpox is sick, and his condition is recognized, while the "open" case of tuberculosis may be in a state of seeming good health for years.

The term disease is a relative one and in tuberculosis the progress from infection to disease is so insidious and the pathological changes so slight that herein lies the basis for the endless differences of opinion regarding tuberculosis and what constitutes tuberculous disease.

We have on the one hand those who will not admit that disease exists until the patient is actually sick, and on the other, those who accept the earliest evidences of pathological change, and decide that then is the time to take active steps in the way of treatment. That those who hold either of these views can ever meet upon a common ground of agreement is not to be expected.

The misconception that tuberculosis is steadily progressive has added greatly to the difficulties of understanding the disease. Its course is not constant. It begins, makes a certain degree of progress, remains stationary for indefinite periods of time, makes a little further progress and again becomes quiescent, and so on often over long periods of years. This erratic rate of progress makes it difficult to estimate the value of therapeutic procedures, and we are often at a loss to know whether the manifestations of improvement in a given case are due to remedial measures we have employed, or are merely the result of one of the spontaneous periods of quiescence so common in tuberculosis. The true test of any remedial measure can only be by its application to a sufficient large number of cases and over sufficiently long periods of time to render negligible this particular factor.

In a similar manner, our knowledge of the early manifestations of tuberculosis in children must come through the formation in our minds of a composite picture, resulting from the systematic

study of large numbers of children who have been exposed to contact with open cases of tuberculosis. This opportunity is offered in our Municipal Tuberculosis Dispensaries, where it is the custom to systematically examine all the members of the family where one member is found to be tuberculous.

Before considering in detail the physical characteristics of the children of tuberculous families, let us see how the tubercle bacillus escaping from an original host becomes implanted in a new individual. The opportunities for infection by dust inhalation and by ingestion are numerically so much greater than in any other way, that other modes of transference are hardly worthy of consideration. The breathing zone of the child is so much nearer the floor that he, more than an adult, is exposed to droplet infection on its downward course, and to "raft" infection by tubercle bacilli floating on specks of dust rising from the floor, so that the younger the child the greater his exposure to infection. Add to this the ingestion of tubercle bacilli deposited upon the food by a coughing parent, or transmitted from the hand of the parent to the hand of the child, and thus to the food, and it is difficult to see how any child housed with an open case of tuberculosis, can escape infection and daily reinfection.

There are two points on which we must readjust our views if we would comprehend the invasion of the human organism by the tubercle bacillus and these are "initial lesion" and "point of entrance." So far as initial lesion is concerned, it is as far fetched to consider, as the initial lesion, some break in the integrity of the mucous membrane as the only avenue of entrance of the enemy, as it would be to regard a broken fence along one of a hundred open highways into a city as the point of entrance of an invading army, or to select a particular hole in a sponge as the place where water gets in.

It has been abundantly proven that the tubercle bacillus can pass through the mucous membrane without leaving any trace behind and I want to call attention here to the dangers of misconception when we invest the tubercle bacillus with the power of attack. The tubercle bacillus is not endowed with motility and cannot pass through the mucous membrane without being carried through by some cell possessed of the power of passing the barriers of a resisting membrane. The tubercle bacillus is seized upon the surface by the phagocyte and carried through into the lymph spaces, and in the effort to digest and utilize its constitutent elements of fat and proteid, the tubercle bacillus is either digested and destroyed, or the leucocyte dies. Upon the death of the leucocyte, this cell, together with its ingested tubercle bacilli is attacked by the endothelial scavenger cell, which can disintegrate the dead leucocyte, but cannot harm the contained tubercle bacilli. The tubercle bacilli are set free to be again attacked by other leucocytes and carried to the neighboring glands.

Having been carried through the mucous membrane into the lymph spaces the organisms follow the lymph stream and find lodgment in the glands. Here they develop very slowly because of two factors; first, lymphoid tissue is relatively deficient in oxygen and the development of the tubercle bacillus under anaerobic conditions is exceedingly slow; the second factor of very great importance is the absence of fat in the lymph stream and the tubercle bacilli is deprived of a necessary element of food. These two factors explain why the tubercle bacillus may remain in the glands for years so that one infected in childhood may show little evidence of infection until adult age is reached. While the development of the tubercle bacilli is inhibited it is not entirely suppressed and they may later multiply to such a degree that some escape. These follow the regular course of the lymph stream till eventually they reach the thoracic duct, and thence into the venous blood stream. Here acted upon by agglutinins, numbers of tubercle bacilli are clumped and it is these clumps which form thrombi in the radicles in the lungs. Here we have another defensive process of the organism, characterized by the attacks on the thrombus by the body cells, resulting in the formation of tubercles. This describes the fate of only the clumps of tubercle bacilli which reach the small peripheral capillaries. The many isolated and single bacilli which are free in the blood stream may be carried to remote parts of the body, producing joint and bone tuberculosis, or be disintegrated and destroyed in the blood stream, or seized by the phagocytes and carried to the bronchial glands. This explains the presence of tuberculosis in the bronchial glands and particularly their presence in the enlarged glands at the hilus. I desire to

emphasize at this point that the theory of extension from the glands at the hilus to the periphery of the lung is untenable except we conceive it to be by way of the thoracic duct and the venous blood stream.

While it is generally true that in experimental infections the course of the infection can usually be traced to the regional lymph glands it is by no means always so. In one of my experimental animals, infected intraperitoneally with a hundredth of a milligram of tubercle bacilli, at autopsy not a single macroscopic tubercle could be discovered below the diaphragm though the lungs were completely infiltrated, so the absence of involvement of the mesentric glands does not prove that pulmonary involvement was the result of an inhalation infection rather than infection by ingestion.

Inasmuch as the first resting place of the tubercle bacillus is always in lymphoid tissue, it is to the glands we must first give our attention in the examination of children for tuberculosis. Glandular enlargement is found in all children who are in contact with open cases of tuberculosis. In these children the sub-maxillaries, anterior and posterior cervicals, axillary and inguinal glands are sufficiently enlarged to be readily palpable. While this is universally true of children exposed to tuberculosis, it is also true that these glands are enlarged in nearly all children. The presence of enlarged glands by no means proves tuberculosis. Hypertrophy of glands is the evidence of combat against infection and if there is any distinction to be observed between the glands of tuberculous children and the enlargement of glands due to other infections, it is that in tuberculosis, the palpable glands are smaller and firmer than those of non-tuberculous children and may be traced along the course of the lymphatics as small firm beads. These glands tend to disappear as the evidence of pulmonary involvement increases, so that in children with extensive pulmonary involvement, glandular enlargement may be very slight and distinctly less than the glandular involvement of the average child. I have come to regard the disappearance of glandular enlargement without the development of pulmonary signs as evidence that the condition was non-tuberculous, and in tuberculous children the shrinking of glands with an increase in their density as evidence of favorable progress toward the control of the disease.

The tendency to regard anemia and malnutrition as evidence of tuberculosis is very apt to lead us into error, for in family groups of children known to be exposed to open cases of tuberculosis, it is exceedingly common to find that the best nourished and least anemic looking children are the ones who present most evidence of active tuberculous disease, as shown by pulmonary findings, high temperature and sensitiveness to tuberculin. With these contradictory indications it is not surprising that there should be so much difference of opinion concerning the diagnosis of tuberculosis in children and safe conclusions can only be reached by summing up all the factors which may give light upon the subject.

The general appearance of the child should first be considered. Upon careful inquiry it will be often found that one of the first things noticed by the observant parent was that the child stopped growing; this is borne out by careful measurements of tuberculous and non-tuberculous children. The tuberculous child is usually undersized and underweight for his age, though it must be borne in mind that the reverse may be true with regard to this or to any other single factor which may tend to prove tuberculous disease.

The posture in standing is relaxed and alar scapulæ are present in nearly all tuberculous children. The hair and skin are dry in children who show more pronounced evidence of disease. No matter how well nourished, the tuberculous child has a weary expression about the eyes, the lower lid may droop sufficiently to show a line of sclera below the cornea and I have long noted a bluish-pink triangle with the lower lid as its base, which I have come to regard as a distinct sign of tuberculosis in children. This bluish-pink triangle is as distinctive in its tint in tuberculous children as is the china-blue-white sclera of the tuberculous individual, in comparison with the gray-white scelera of the simple anemic.

The pupils of the tuberculous child are usually dilated and markedly dilated if the child is noticeably toxic. If inequality of the pupils is noticed, one may suspect pulmonary activity in the apex on the side on which the dilatation is more marked. In adults, dilatation of one pupil will

often be found to precede signs of activity in an apex.

Discharging ears, of tuberculous origin, excoriations within the nose and about the alae nasi are common in children who are exposed to massive and repeated infections and these should be regarded as open cases of tuberculosis.

The mouths of tuberculous children show an average of five bad teeth and the diseased gums about the carious teeth form easy avenues of entrance for the tubercle bacilli as well as for other organisms.

The tonsil has been much discussed as the portal of entrance, for tuberculosis. It is only one of many points of entrance and the decision as to whether it should be removed or not depends upon other factors, rather than upon the possibility of its harboring some tubercle bacilli. Of one thing I am convinced however, and that is, that no tuberculous child should be subjected to a surgical operation upon tonsils or tuberculous glands until an attempt has been made to raise the immunity of that child against tuberculosis, by the administration of some preparation derived from the tubercle bacillus.

In the examination of the chest our attention is first struck by the dilatation of the superficial veins usually associated with marked enlargement of the mediastinal glands. A further evidence of this enlargement is Smith's sign, which consists of a systolic murmur produced at the right border of the manubrium when the head is thrown back. The chest examination differs little from that of the adult with the exception perhaps that it reveals the greater frequency of tuberculous deposits in the bases of the lungs of children than in adults. The more general bronchitis I find in a child, the less inclined I am to interpret it as evidence of tuberculosis, while fine, moist rales confined to a small area in a lung may be regarded with grave suspicion.

No matter how expert we may be in the interpretation of physical signs, we can obtain more direct evidence of tuberculous disease by the use of tuberculin than in any other way. This phase of the subject is worthy of more extensive consideration than can be given within the limits of this paper and I shall content myself with presenting as a preliminary report some of the conclusions drawn from a study of more than seven thousand von Pirquet tuberculin tests, applied to about five thousand individuals, both children and adults.

The von Pirquet skin reaction has the same significance in adults as it has in children. It is a serum reaction and expresses a certain property possessed by the blood, and from this reaction we are not justified in drawing any conclusions regarding the presence of a given tuberculous focus, and we are no more justified in concluding that a positive von Pirquet reaction indicates the presence of a tuberculous focus than we are in concluding that, because we have a positive Wassermann reaction, our patient has a leutic sore throat. The mere statement that a von Pirquet reaction is positive or negative gives us little information, but if we will make a careful study of the character of the reaction produced, we will obtain valuable inforamtion regarding the defensive processes going on in the blood of the patient, and if we can predict from our physical examination and other obtainable facts the character of the reaction we should expect, then the skin reaction will prove a valuable aid. Furthermore, since it can be predicted from the character of the reaction in either an adult or a child how many milligrams of tuberculin will produce a systemic reaction, then the reaction may be regarded as of diagnostic value in adults as well as in children.

A poorly nourished child under one year of age in the arms of a tuberculous mother who is an open case, will usually give a negative von Pirquet reaction. A tuberculous patient who gives a slight reaction will, after the continued administration of some preparation derived from the tubercle bacillus, give reactions of increasing intensity which coincide with other physical signs of improvement, and on the other hand the tuberculous patient who is losing ground will show reactions of decreasing intensity and will finally fail to react at all. A negative reaction in a child is not conclusive evidence that the child is non-tuberculous any more than a positive reaction is evidence that the child is the victim of tuberculous disease. The value of the skin reaction is dependent upon the skill of the observer.

The use of tuberculin promises more in the treatment of children than any other remedial measure and by tuberculin I mean those substances prepared from the tubercle bacillus.

I find it difficult to understand the attitude of

mind of those who believe in the efficiency of vaccines and yet do not believe in the value of tubercle preparations for they are essentially vaccines as we now use the term.

Children bear large doses of tubercle proteid better than adults and if we hope to stimulate the production of immunity we must give appreciable doses. This is especially true if operative procedures are contemplated and it is desired to enable the blood of the child to take care of any tubercle bacilli that may be squeezed out into the circulation by the manipulation incident to the operation. It is unwise to undertake any surgical procedure until a child can endure a dose of 0.4 or 0.5 milligram of tubercle proteid without severe reaction.

Operations upon the glands are usually resorted to when caseation is present and often without a full consideration of what produces caseation, which may be regarded as a phenomenon of partial immunity. We can produce caseation experimentally at the site of injection by the introduction of sterile fats extracted from the tubercle bacillus, and we have a parallel to this procedure, when by the subcutaneous injection of too large a dose of bacillen emulsion, we produce in certain tuberculous patients who have partial immunity, a small cold abscess containing a few drops of sterile pus at the site of injection.

The significance of this is, that the patient has amboceptor for tubercle proteid, but none for tubercle fats. Caseation occurs only when tubercle proteid has been disintegrated by lysins, leaving undisturbed the lipoids which have the property of producing necrosis when in concentration. This explanation accounts for cavity formation and caseating process in glands.

The practical point to be remembered in this connection is that in the pus in softening glands, there are many living tubercle bacilli which have escaped the destructive process and which, if forced into the circulation, may result in dissemination. I would, therefore, urge the utmost conservatism with regard to all surgical procedures in tuberculous children.

The tuberculous child should be under skilled medical observation from the discovery of his condition until he has safely passed the period of adolescence and to this end the open air school proves to be the most practical means. A child once placed in an open air school should there continue throughout his school life. In the open air school with its abundance of fresh air and good food we have the facilities for supplying that third essential, which to my mind is the equal of the other two, and that is the opportunity of affording to these children the advantage of prolonged rest. I have had the gratification of seeing wonderful results from keeping a tuberculous child on all day rest for a period of several months, in certain extreme cases, when ignorant parents absolutely refused to allow the child to be sent to a sanitarium.

25 East Washington Street.

MEDICAL COLLEGE TRAINING.*

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It is indeed gratifying to us of the medical profession that you have invited the discussion this evening of the importance of giving medical students more thorough training in the diagnosis and treatment of tuberculosis, for we have an obsession, perhaps not fully justified, that the public in general, and especially the educated to whom we should look for support, is not quite loyal enough to us in our attempt to raise the standard of efficiency in our graduates. Whenever we propose new laws governing medical practice, laws designed to protect you, there is a pretty well defined suspicion prevalent among our friends that we have some selfish motive in view. We teachers cannot understand this, for any increase in the requirements demanded of our graduates decreases the number of our students, raises the expenses of maintaining the school and increases the number of hours which we teachers must spend with our students. Our desire for better laws is without qualification altruistic and self-sacrificing.

You have asked me to present the educator's point of view concerning tuberculosis, so I will proceed: It is a safe rule in pedagogics that since ontogenesis runs in general parallel to phylogenesis, we should in the presentation of a subject to the student follow, in so far as possible, the historical development of that subject. Our students make the acquaintance of tubercu-

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losis first under the guise of several apparently distinct diseases. Scrofula would at first seem very different from white swelling of the elbow, consumption from spinal disease, tabes mesenterica from Addison's disease, pleurisy with effusion from one form of menigitis, etc. But soon the students see the unity of these conditions, understand that the manifestations of one and the same disease in different organs must be very different since the functions of the disturbed organs are so different. This, the first stage in his education concerning tuberculosis, we will designate as that of organopathology, or the study of this one disease in separate organs, clinically separate diseases and with quite different symptoms.

Very early, however, the student studies Bacillus tuberculosis, a parasite which is the sole cause of tuberculosis. Now the disease assumes the form of a biological problem, and he realizes that since he knows better than others how this disease spreads he cannot escape the responsibility of warning his neighbors, as well as his patients, of the dangers of careless habits of expectorating; he cannot but urge the enaction of better housing laws. He studies tuberculosis of cattle and finds that he has a responsibility towards the public in matters of meat and milk inspection. His conscience should make him a voluntary public health officer.

In the junior year of his medical course the student awakens to the realization that tuberculosis is a disease of the whole man, not of individual organs. Contracted often in infancy and latent perhaps for years, the disease finally may (or may not) cause such disturbances by its inroads into almost any organ or organs that the patient cannot but become painfully aware of its presence.

The fourth stage in the student's education is reached when he sees that the so-called symptoms of tuberculosis really are not evidences of the attack by the parasite upon the body but rather are manifestations of the defense of the individual against the disease. He finds that he is in the position of one overhearing another in conversation over the telephone; he hears but one side of the conversation. So our student studies in vain for the manifestations of the disease, that is, of the attack. The pains are evidently warnings, the fever is a protective phenomenon; the tubercles are masses of tissues thrown up as bulwarks around the parasites; the cavities are attempts at healing; even the patient's death resembles the suicide of the Roman soldier who, when the tide of battle turns against him, thrusts his sword into his own breast; so death would seem due to the same mechanism which previously protected the patient. But the result of this discovery is a radical change in the attitude of the student towards the disease, for he sees clearly that his duty is to strengthen the patient, to aid in his defense. Destroy the germ directly he cannot, but aid the body to destroy it, he can. Unconsciously he becomes interested in organized efforts to procure for the patient long continued periods of rest, better foods and facilities for living in the open air.

The fifth step is taken when the student sees that tuberculosis is not a disease of the isolated individual but of the family, which must be treated as a group if its individual members are to recover, for all in the family share in common dangers, all are somewhat similar in their powers of resistance and, as a rule, each often owes his infection to one or more others near him.

And finally the student sees that this disease is not alone one of the family but of society at large. The patient not only has a home but a place where he works, another where he amuses himself; he has not only a family but fellow laborers who may receive the disease from him. His work itself may add to his dangers by tending to lower his resistance, and our student finds that he cannot but interest himself in sociological problems and philanthropic activities which formerly would have seemed far removed from his medical studies. At last he realizes that as a physician his first duty is to the public at large; second, to his individual patients. One result is that about 50 per cent. of our medical students have been enrolled as active volunteer workers of the Social Service Department of Indiana University.

But such a complete evolution of the student's ideas is possible only if his education is of the best. The better the courses in laboratories and wards, the harder he works with microscope, test tubes and stethoscope, the better chance there is that he will interest himself later in pubic health movements, in charity organization societies and in congresses such as this. If you wish doctors

who will and can lead in these movements, and you complain that your doctors do not, then give them better laboratories, better hospitals and better teachers; that is, vote for increased appropriations for our medical schools and for laws which will require better premedical and medical training. And don't suspect that it is a selfish motive which prompts us to ask these things. You cannot have a good harvest unless you start out with good plants and take good care of them, and the quality of the ripe fruit bears a very direct relationship to the flower and the green fruit. A doctor may desire to aid in philanthropic movements for the better control of tuberculosis and the better care of consumptives, but the better trained he is in the scientific subjects of medicine the more certain is he to support benevolent movements and the more aid will he be in them.

You often wonder why we do not in our medical schools make more of a specialty of tuberculosis, have separate clinics for it and more doctors who treat this disease alone. We do have special dispensaries and wards for tuberculosis patients, but this is chiefly for the protection of the other patients. One cannot safely make a specialty of tuberculosis except insofar as safety or convenience may dictate. This disease is so prevalent, attacking 90 per cent. of all persons some time during their lives, attacking any and every organ of the body, masquerading under the guise of so many other diseases and so many other diseases under that of tuberculosis, that to understand this disease well is to be efficient in the general range of internal medicine. Tuberculosis is one of the half dozen subjects around which the interest of each man in a dispensary more or less revolves. The tuberculosis problem is coextensive with the whole problem of medicine, surgery and the specialties. You cannot safely train a man well in this subject alone, and for that same reason you should suspect one who claims that peculiar training.

In conclusion I beg the members of this association to interest themselves in the support of better medical schools and in the enactment of more efficient laws governing medical practice. Prevention is the master word in the tuberculosis problem and the surest means of attaining this is the elaborate education and loyal support of picked men for general practitioners; men who, whether appointed for this purpose or not, will raise the general standard of public health, educate the public in matters of housing, food inspection and cleanliness; men who will make earlier diagnoses of the disease and treat it well. Indeed, I know of no better way in which this association could attain the results for which you so earnestly are striving.

UROCHROMOGEN REACTION IN PULMONARY TUBERCULOSIS.

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Various tests, signs and symptoms have been noted as being of great value in the diagnosis of tuberculosis. The prognosis is usually relegated to a small paragraph and is limited to a few clinical observations. And yet in practice, next to the diagnosis and almost of equal importance to the physician, the family and the patient, is the question of the prognosis. The recent work of M. Weisz,[1] describing a new laboratory test as an aid in the prognosis of pulmonary tuberculosis, therefore, becomes a matter of great interest. This paper, covering my observation in 155 cases, in the service of the Cook County Hospital and the Municipal Tuberculosis Dispensary, is based on the problem as worked out by Weisz.

Weisz, following work done by Ehrlich, had noticed that tubercular patients having a positive diazo reaction, as a rule gave a poor prognosis and but rarely improved or recovered. On the other hand those who had a diazo negative urine usually were improving and ultimately recovered. But he observed that the diazo reaction lacked uniformity in its appearance in the urine. Weisz in the course of his study noted that urochromogen was present in urine. This he believes to be a decomposition product of urochrome, the normal coloring matter of the urine, which has undergone a defective oxidation due to the presence in the body of vast quantities of toxins.

In the United States, the first work in this line was done by Heflebower[2] at the government's sanitarium at Ft. Bayard, N. M. He concludes, as does Weisz, that "A constant negative urochromogen reaction indicates that a case is progressing favorably while a constant posi-

tive result indicates a progressive downward case."

The urochromogen test is dependent on the reaction of potassium permanganate on the urine. Two test tubes are to be taken. In each is to be poured 1 c.c. of the urine to be tested and 2 c.c. of distilled water. One tube is now used as a control while to the other is added three drops of a 1:1000 solution of potassium permanganate. The test tube is shaken thoroughly. A positive reaction is indicated by the formation of a yellowish color in the treated tube. Various degrees of a reaction are indicated as being urochromogen plus one, two or three, depending upon the intensity of color reaction.

In my work, covering eleven months, there are sixty-seven cases living and eighty-eight are dead. Of those alive, twenty or 30 per cent. by the history, physical findings, temperature, pulse and course, gave a good prognosis. Twenty-six or 38 per cent. gave a fair, while twenty-one or 31 per cent. gave a poor prognosis. According to their urochromogen reaction, in the series of the living cases, forty-one or 61 per cent. had one or more negative tests, six or 9 per cent. had both negative and positive reactions at various examinations while twenty-one cases or 30 per cent. had positive reactions. Of the twenty cases that gave a good clinical prognosis fourteen or 70 per cent. gave a constant negative reaction. Of the twenty-six with a fair prognosis nineteen or 72 per cent. gave a negative reaction. Of the twenty-one that gave a poor prognosis seventeen or 80 per cent. gave a negative test and only four or 20 per cent. gave a positive. Thus we find that cases apparently with good chances to recover will give a greater percentage of positives than will cases apparently hopeless.

In my series of eighty-eight dead only one case or 1 per cent. plus, on first examination gave a good prognosis and at the same time a negative urochromogen. Death was due to a rapidly progressing acute nephritis. Only nine or 10 per cent. of the cases gave a fair clinical prognosis and seventy-eight or 88 per cent. gave a poor prognosis.

Of these seventy-eight cases, sixty-five or 84 per cent. gave a positive reaction. Five of this number only being positive just previous to death, while seven who previously had given a positive reaction, a day or two before death gave a negative. Of the nine cases clinically fair as to prognosis, seven gave a positive reaction. In this series are five moribund cases with a urine examination within twenty-four hours of death and all gave a negative urochromogen test. One of these five cases was a generalized miliary tuberculosis; a diagnosis corroborated on the post mortem table.

Comparisons of prognosis by both laboratory and clinical methods give us the following. Of the total number living, twenty-one gave a poor prognosis clinically while twenty of these cases gave a positive urochromogen reaction. Of the total number dead seventy-eight, or 88 per cent. gave a poor prognosis on clinical basis, while only sixty-five, or 73 per cent. plus, gave a positive urochromogen. But taking out of consideration the five moribund cases, leaves us a positive percentage of 79 per cent. plus.

Thus we find that we have a fairly constant ratio between our errors in the clinical and the laboratory deductions in our fatal cases, but among the living cases the margin is in favor of the urochromogen test; of these 31 per cent. gave a poor outlook clinically, while only 20 per cent. gave a positive reaction.

Conclusions:

(1) I believe that in view of these results, further investigations are justifiable, which may bring out a work of great value to tuberculosis workers.

(2) That cases although clinically unfavorable, but with repeated negative reactions, frequently improve or apparently recover.

(3) That a positive reaction, especially if repeatedly present, is a grave sign; especially in our ambulant cases.

(4) That in the bedridden or terminal cases, the clinical prognosis is slightly more accurate than the urochromogen test; due probably to some urinary changes as those evidently present in our moribund cases, which result in a negative urochromogen.

(5) That the test is by no means conclusive and at present should only be used as a check on our clinical work not as a specific method in the prognosis of pulmonary tuberculosis.

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THE BEST TUBERCULOSIS PREVENTION FROM A PATIENT'S STANDPOINT.*

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I feel that it has been very unfair to place me on this program with all these public speakers, but I will do the very best I can for you.

I am not here because I know anything about tuberculosis.

Three years ago I came home from the West, and since that time I have tried to forget rather than to remember about it. But when I heard of this conference I was like an old war-horse that smells powder—I began to prance, though I certainly had no idea it would land me here.

Now I am to give you a patient's idea of the prevention of tuberculosis. With every regard for the opinion of you who are so much better informed than I, and with whom I shall no doubt take issue, I can only present the conclusions I have drawn from my own experience, and from the experience of the many, many tubercular patients with whom I have spoken during my sojourn in the West.

Perhaps the shortest cut will be to tell you my own story. When I was a school girl I was ill for several weeks with "walking typhoid fever," followed later in the year by pleurisy. Several years later a severe cold "brought on" tuberculosis. It was recognized and I was hustled off to Colorado. Here I became a patient of that splendid physician and gentleman, the late Edward S. Solly; no doubt many of you have known him. Under his care I greatly improved, but somehow I did *not* gather the idea that I could get well. I do not mean to criticize Dr. Solly; no doubt his advice would have been all sufficient had I ever paid any attention to the subject of tuberculosis. I had not been taught as the public is today and *therein* lies the fault.

There was not an anti-tuberculosis organization in the country at that time. No one but doctors was given any particular thought. I was filled with the idea that I must die—and that shortly. I vividly recall the years when my last thought at night and the first in the morning was, "I am a consumptive." It was not until, as a last chance, I went to the Agnes Memorial Sanatorium in Denver that I really began to know and understand about tuberculosis, and to realize how altogether different my life and the lives of my fellow-sufferers might have been had we but understood long years ago.

Briefly, as I look back over the years and think of all it has meant to me to have tuberculosis, I wonder what would have prevented it.

It seems to me that had I been taught at home and at school the relation of fresh air and proper nourishment to health; had I been taught in plain words how to avoid tuberculosis by keeping my "resistance" up to normal; had I been made a "fresh air child," I believe tuberculosis need never have claimed me as a victim. But there is something else to be said and you will not like to hear it. Suppose when I had "walking typhoid fever" it had been properly diagnosed and known for incipient tuberculosis (which it really was) and I had been told how to live and how to care for myself, is there not good reason to suppose I would have escaped the desperate fight I have had? Granted that this was several years ago, what of the thousands of cases today that are being diagnosed as malaria, stomach trouble, liver trouble and what not?

I am well aware that doctors do not like to hear this side of the story, but neither do the 500,000 tubercular victims in the Mississippi Valley like to have tuberculosis. There are various reasons why it was not prevented in their cases. I have an opinion or so on the subject about which I am very *sot*.

Last winter the Indiana legislature passed a bill making it the duty of the doctor to report all cases of tuberculosis known to him—to keep up with us and fumigate us, and so on, which is all very well—but I believe it is time to begin to talk and legislate at the other end of the line. I would like some legislating done about the doctors (present company always excepted).

Just here let me assure you that to that splendid body of men, who are doing all they possibly can in this fight for humanity, who are giving of their time and talents, that tuberculosis may be stamped out, in the name of its 500,000 victims in your states and mine, I take off my hat.

I refer, of course, to the far-too-frequently found general practitioner, and the occasional so-called lung specialist, whose failure to cor-

*Read at Mississippi Valley Tuberculosis Conference at Indianapolis, Sept. 29, 1915.

rectly diagnose tuberculosis has long been a weariness to the flesh—and worse. I wish I might tell you the stories that have been told to me by victims of this very incompetence. Since I am one of the victims, I think I have the right to feel very strongly about it.

I believe it is time to ask for a higher standard of efficiency in the detection of tuberculosis. Medical graduates have been "supposed" to be able to detect it long enough—it is time to *require* it. The fight against tuberculosis is recognized as the fight of the ages. Then why not give the medical student training that fits him for the fight? If, as you tell us, the doctor who can detect incipient tuberculosis can detect almost any other disease, is it not a most desirable qualification to possess? For proof that I am somewhere in shouting distance of the right idea, I refer you to the statements made here last night by Dr. Emerson and Dr. Lanza, the latter of whom said, "It *is* a reproach to us that we do not detect it oftener." I believe, to detect it in the very incipient form to which Dr. Lanza referred, is *practically* prevention. Then what are we to do about the doctors who, having discovered tuberculosis, do not or will not tell the patient his trouble. Why not name it? When the doctor finds we have typhoid fever or locomotor ataxia he says so, and we set about getting rid of it if possible. Why this mystery and whispering in corners about tuberculosis? It is a disease, it is not a crime.

And why this fanatical fear of tuberculous patients, particularly of sanatorium patients, and even of the very sanatoriums themselves. So long as you deny having tuberculosis and hide it and scout the very idea, you are safe, nobody fears you—but admit it—adopt sanitary measures, or go so far as to go to a sanatorium—ah, there's the rub. As I have told you, I have been to a sanatorium and I know. I recall visitors who came in wide-eyed curiosity to see the "inmates"—some only ventured near enough to the porches to ask idiotic questions—and to receive very suitable answers. For instance, one old gentleman before venturing near always put disinfectant on his beard—this operation he repeated when he left our "polluted" quarters. I do not forget my friends or the many other visitors who came for friendship's sake and for the cheer they brought, but these ideas do prevail, and it is because of these ideas and because of the dread of becoming an object of curiosity, and something to be shunned, that people are denying their condition, and are thereby scattering the germs broadcast.

Such public sentiment is doubtless responsible for the recent attempted legislation, whereby tubercular patients were to be kept from all public gatherings. The Indiana legislature spent nearly two days wrangling over this very thing last winter.

Now, if it were at all necessary, I would be willing to be corralled, and fumigated, and reported and otherwise entertained; I would be willing to stay away from church and the theater, and if it were thought to be detrimental to the animals, caged and otherwise, I would stay away from the circus, and I think I speak for a vast majority of tubercuolsis patients when I say this. But there is one provision to this agreement: In the name of humanity can there not be some fair means of finding out all who are tubercular and treating all alike. If, as we are told on high authority, nearly all of us are at some time tubercular, let's *not* fasten all the punishment, social, industrial and every other kind, onto those whose condition even the most ignorant know.

Isn't it time for the pot to stop making remarks about the kettle?

Samuel Hopkins Adams declares "it is high time the public be taught the truth about the Great White Plague and that they learn that we do not 'catch consumption' as we do a cold or the measles." That such ideas prevail he lays at the door of "health authorities, anti-tuberculosis organizations and the medical profession in general," who, he says, "have inspired the public with an unreasonable and cruel horror of any person afflicted with tuberculosis, a horror often expressed in a tragic ostracism." Mr. Adams quotes Dr. Baldwin of Saranac Lake, N. Y., as saying: "It is time for a reaction against the extreme ideas of infection now prevailing."

It seems to me this is a blow at the very root of the trouble and the sooner the public *unlearn* a lot of ideas propagated by alarmists and extremists, the better for all concerned. Why, it was only the minute before last in the whirl of the ages since Professor Koch discovered the tubercular germ. Phthisis was rampant in Bible times—the germs began to be some time, maybe

"when I was a tadpole and you were a fish in the Paleozoic age." Surely if it had been the infectious thing some theorists have held, you and I would not be here today, for our ancestors and Robert Koch's ancestors, and their ancestors, would all have been laid low long ago by tuberculosis. Happily, the better class of physicians is advocating that there is very little danger in even close contact with open tuberculosis, and according to some authorities none at all in ordinary association.

And so, from a patient's standpoint, I would say, teach the public in *every available way* to preserve health—and that is of first importance. Teach them that only the trained and practiced ear can detect incipient tuberculosis, and then ask the medical schools to furnish the ears, properly equipped. Teach the public, and that means teach the children, how to face the situation in a sane and practical manner.

It is *time* that the way be made easier, so that people are not afraid to consult a physician, and not afraid of ostracism if the verdict be incipient tuberculosis.

What a calm after the storm it will seem when sensible ideas prevail, and when to be in the presence of tuberculosis victims, indeed to visit a sanatorium, will not be thought to be as tragic as the "Charge of the Light Brigade."

TUBERCULOSIS PREVENTION FROM A PHYSICIAN'S STANDPOINT.*

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DUNSEITH, N. DAK.

It may be of passing interest to the members of this conference, most of whom live within the tropics, that is, within the tropics of the tempering breezes of Lake Michigan, to know that I come from a border state, close to Canada, and that we have a state sanatorium that is located within fifteen miles of the national boundary. It may also be of interest to know that we have cold weather up there, and that last winter our coldest day was 42 degrees below zero, and that we are still conducting a sanatorium, and in that sanatorium people sleep out of doors, and those people who sleep out doors are tuberculosis patients; some advanced, some moderately advanced and some incipient.

I simply mention this in passing, for the reason that it brings home to us the fact that fresh air is after all the great cure and the great preventive.

Racial immunity, as found in yellow fever among tropical dwellers, is now being purchased in tuberculosis at a tremendous sacrifice in human life. The weaker individual succumbs, that is, the individual low in resisting power. There can be little doubt that the race is gradually evolving, throughout the centuries, an average human type, upon which the tuberculosis germ, no matter how malignant, will remain innocuous.

It would seem that nature tends to preserve high averages at the expense of the weaker, as well as the stronger types. The robust are destroyed by war or diseases peculiar to the type; the weaker fall victims to tubercle and other chronic diseases. Thus we find that less than two per cent. of the people in the United States have *active* tuberculosis, while approximately ninety per cent, have the latent or non-clinical type. By the latter is meant that large class of persons who show sensitiveness to tuberculin, and yet in whom the disease tuberculosis is entirely in abeyance. Such individuals, although they are without doubt repeatedly reinfected, remain able to resist.

The health of the average person, therefore, insofar as tuberculosis is concerned, must depend upon an over-correction or over-balance of resisting power against bacilliary infection, whether old or new. "To him that hath shall be given." Each effort of the resistant to overcome fresh infection results only in new strength. In this way may be developed in each individual both a relative immunity to the tubercle bacillus, and at the same time sensitization to its products.

Ignorance, superstition and vice have always obstructed nature's plan of betterment. The Chinese coolie, whose sleeping room is 4 feet by 8, the American Indian, who relinquished the airy tepee for an ill-lighted, and filthy shack, the negro, who crowds the city slum tenement, the American who refuses to apply to his methods of living the elementary rules of proper hygiene alike suffer personally, and serve to obstruct to a greater or less extent the working out of nature's plan. The two per cent. of active cases is constantly being recruited from the im-

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mensely larger class which nature has already strenuously attempted to preserve. In infancy, where primary infection has not yet occurred; in childhood, where nature's protective inoculation is yet insufficient; in adolescence, where the vital forces are actively occupied in constructive effort; during lactation, and in the temporary health-bankruptcy or convalescence from acute concurrent disease, is the invasion most likely to occur. Tuberculosis during infancy has long been known to be almost always fatal. The slum baby as well as the healthful prairie farm infant, may become infected with equal facility through the use of milk from tuberculous cattle. A few years ago, while acting as health officer in a prairie city, I found fourteen per cent. of tuberculosis in dairy herds. The milk was being sold, used promiscuously with the result that glandular, bone and joint, as well as meningeal, tuberculosis in children were fairly common.

By misdirection of effort much of the anti-tuberculosis work of the present time is wasted. The farmer cultivates his more weedy fields for the purpose of eradication. The Tubercle Bacillus, the most noxious vegetable organism of the age, finds only in certain classes of humanity the suitable growing soils. By directing our efforts to these classes we shall accomplish where we otherwise fail. If, as many authorities state, more than 60 per cent. of children become infected before school age is more than half completed, it seems that this field needs especial cultivation; if resistance is lowered very materially during concurrent diseases, this class of patients should receive especial attention in our prophylactic efforts. It is obvious to even the superficial observer that nature's methods of repair are most successful when not obstructed by improper living. Post mortem work reveals scars, healed cavities, encapsulated colonies of inert bacilli—battlefields reclaimed by wonderful reconstructive effort. Is it in the least degree improbable that a very large proportion of the 90 per cent. of infected individuals have been relatively immunized for a shorter or longer period at the time of sensitization? Is it not probable also that only after multiple reinfection and in the presence of such conditions of lowered resistance, produced by habitual error in living, is this relative immunization overcome, allowing complete invasion of portions of tissue poorly supplied with nourishment or oxygen—as, for example, vertebral bodies and lung apices? Our work should understudy nature's method and should endeavor to protect chiefly those classes where nature fails to do so. If tuberculosis in the first year of life is almost uniformly fatal, why not direct a larger effort in the tuberculosis campaign to the education of mothers, as to cleanliness and sterilization of food and to the disinfection of toys and other articles that the child carries to its mouth; also to moist cleaning of rooms to avoid dust? If school children are more especially susceptible to the disease from lack of nature's protective inoculation, should we not place the hygiene of school life under more complete medical supervision? If certain individuals are born with a susceptibility of infection and a lack of balance of resisting power, should not these be placed under careful institution treatment at all times until a standard of health and development could be reached? Selection from some strain of acid fast bacilli, of a vaccine of sufficient attenuation to be used as a protection in such cases, would be a preventive measure of real value. The efforts of publicity campaigns should be directed to those classes of persons most likely to succumb to reinfection.

Early Diagnosis. This question has been much discussed, and the responsibility of the physician has been variously estimated as to percentage of failure to recognize early symptoms. It is true that a majority of patients who apply for treatment at dispensaries and sanatoria have arrived at the moderately advanced stage. Incipient cases frequently fall below 15 per cent. of applicants to sanitoria. We believe, however, that the average physician who exercises ordinary care and average skill seldom fails to recognize the incipient form. The diagnostic failure is nearly always due to hurry, a hesitancy to call for reexamination, or a reluctance to attach the tuberculosis stigma to patient or family. The disease frequently is engrafted upon other illnesses so that the symptoms merge. Many patients are slow to seek or follow advice, or for monetary or other reasons cling to daily duty. From lack of proper school inspection many children have the glandular form for months and are allowed to continue school duties. To secure early diagnosis, systematic inspection of all homes, schools, public buildings and careful medical examina-

tion at regular intervals of all school children, factory workers, store clerks, etc., is necessary.

The All-Time Health Officer. This official should be appointed at an adequate salary to give all of his best efforts to the public health work of each health district, whether this be city, precinct or country township. He should have had special training in public health work, and be allowed such nursing assistance as necessary. He should be invested with authority to control disease by enforcement of quarantine; should supervise meat and milk supply, should inspect schools, calling attention of parents to diseases of eye, tonsils, pharynx, lungs, glands, etc.; should select such cases for open air treatment in schools, camps and sanatoria as suggest tubercular nonresistance.

By systematic use of tuberculin in early diagnosis, a more accurate estimate could be made as to the exact time of the infection, and the source traced and removed.

The all-time health officer, equally effective whether in city or country, should be appointed without favor. His intellectual bias should be executive, as well as scientific, and his moral standing in a community should be that of priest of cleanliness and minister of good health. Not until municipal health inspection is valued as the greatest public economy shall it be reasonable to hope for a complete extinction of tuberculosis in children or a great lessening of the death rate due to digestive diseases.

The Actively Tubercular Patient. Segregation of advanced cases should be compulsory whether at home or in an institution. The far advanced patient in the later weeks of his final illness generally loses his sense of cleanliness as to sputum, hygiene, and his sense of duty to family and community. The average bed-fast case requires constant nursing supervision. Segregation in institutions is most economical and efficient. Moderately advanced cases, if the disease is quiescent, may be allowed parole to their homes after a certain period of habit forming education at a sanatorium. Such patients, however, should be under medical supervision at all times.

It is therefore to be concluded as follows:

1. That tuberculosis preventive effort should be concentrated more especially upon such classes of people as are found to be of low-resisting power, e. g., infants and school children.

2. That such work can best be performed under the careful supervision of an especially trained medical executive, who will devote all of his time to this work.

3. That more rigid restriction should be placed upon the germ carrier, more especially those of the advanced type, and that where possible these should be placed in suitable institutions.

THE EARLY DIAGNOSIS OF TUBERCULOSIS.*

A. J. Lanza, Past Assistant Surgeon
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It may sound somewhat paradoxical to apply the term prevention in connection with a condition already established, nevertheless in the broad field of tuberculosis prevention, in which we are all interested, no factor is of more importance than early diagnosis. Even with our constant endeavor towards improving those industrial and sociological conditions that are responsible for tuberculosis there is a long stretch of future in front of us before we will be able to limit or control their harmful results. The sum of our endeavors in this direction may be likened to a weapon of war whose parts are not yet fully perfected and with whose mechanism we are not yet entirely familiar; but in the early diagnosis of consumption we have at hand a weapon efficacious and at the command of any one of us that cares to use it.

It is no reproach to us that we cannot, so far, prevent tuberculosis, for the numerous antituberculosis and kindred societies represent earnest, widespread and continued endeavor. But it is a reproach to us that we do not recognize tuberculosis more frequently when we see it. The trouble, worry, suffering, poverty, infection of others—the end results of any given case of consumption occur after the early stage is passed. The prevention of these, the lessening of economic waste, the restoration of the consumptive to health, depend on early diagnosis. Broadly speaking, early or moderately advanced consumptives get well, advanced ones die. Between these two extremes, correct diagnosis is the only barrier. Correct diagnosis is not a matter of theories but largely a matter of facts and the

*Read at Mississippi Valley Tuberculosis Conference, Sept. 20, 1915, at Indianapolis, Ind.

application of these facts should be within the reach of every individual in the community. We therefore have two sins against tuberculosis prevention, the sin of commission, when the early consumptive, having come before us, we fail to apply the proper methods to demonstrate his disease; and the sin of omission on the part of the community or state which fails to provide the individual with the opportunity for correct diagnosis. I refer to school inspection and the inspection of workers and work places. We are not always able to avoid sins of omission but we cannot escape the responsibility for sins of commission.

The early diagnosis of tuberculosis has a broader scope and a more general application than the diagnosis of early or incipient tuberculosis. Early diagnosis may be taken to include the diagnosis of tuberculosis as it first comes to the general practitioner, whether it be incipient or moderately advanced. Far advanced tuberculosis does not often appear for medical treatment as a first offender. When we inform a patient, previously ignorant of the fact, that he is an advanced consumptive, our verdict nearly always implies that he has applied for treatment at an earlier stage without his disease being recognized. So it may be stated that the early diagnosis of tuberculosis consists in the application of certain principles and methods that will enable us to recognize the disease when the patient first applies for symptomatic treatment.

When a patient presents the classical symptoms of cough, fever, nightsweats, loss of weight and hemorrhage, the diagnosis proclaims itself. But we are dealing rather with that group of patients who present the various constitutional symptoms to which we apply the term "run down." They are easily tired, or tired all the time, they have loss of color, loss of weight, general incapacity, insomnia, loss of appetite or other complaints directed at the digestive system; headaches or aches and pains referred to one or both shoulders. Sometimes a cough is present or just a clearing of the throat without distinct cough. Or the patient may become irritable, quarrelsome, hard to get along with in the office or at home. Any one or more of these symptoms is suspicious and should put us on our guard. If we will bear in mind that one-third of the deaths in adults over 18, both men and women, are due to tuberculosis, we cannot but consider tuberculosis as a possibility in any patient with constitutional symptoms. No such patient should be allowed to get away without a thorough examination.

A history of pleurisy, aside from acute pneumonia, or a history of hemorrhage, especially in a young adult, practically always means active or clinical tuberculosis at that time. A history of fistula, ischiorectal abscess, otitis media or cervical adenitis is always suspicious. A history of ethmoidal sinusitis is not often obtained but is suspicious when it is. When any of these occur in the history we are justified in concluding that it is probable that the patient had active tuberculosis at the time specified, especially if we can elicit that there were night-sweats or cough also. Consequently we must conclude that it is possible that the patient now is suffering from a renewal of activity of an old tuberculous infection even though the usual or classical symptoms are not present.

When a patient has had pneumonia, grippe, typhoid fever, "bilious fever," "remittent fever," "lung fever," "swamp fever" or any other kind of fever, including typhoid pneumonia, or just plain fever within the past two or three years, it is not always practicable to ascertain just what was the nature of his illness, but ask him if he has ever been as well since he had his fever as he was before. If he says no, he has never been as good a man since as he used to be, we have one point and a strong one ready made for our diagnosis.

The mere fact that there was tuberculosis in the parents, grandparents or other relatives is not so important as the history of continued or intimate exposure to an active case of the disease. The occupation of the patient and the length of time he or she has followed it is worthy of attention, for a consideration of the nature of the patient's work will often illuminate symptoms; besides which, occupations of certain kinds tend to change the contour of the chest and must be reckoned with in the physical examination.

Physical examination should be insisted on not only for those who have cough, fever, nightsweats or hemorrhage, but those who present the indefinite constitutional symptoms above referred

to. For a proper physical examination it is essential that the patient be stripped to the waist and examined in a good light. A high stool is a great convenience, because it relieves the patient of the strain of standing, brings his chest on a level with the examiner so that the latter does not have to stoop constantly, and leaves all sides of his body readily accessible. With the patient thus situated we are prepared to inspect, percuss and auscultate our patient with complete satisfaction. Without going into the matter in detail one proceeding is of utmost importance, namely, auscultatory cough. Listening to the cought at the end of expiration and followed by an inspiration is the most valuable part of a physical examination. The gentle cough at the end of expiration stirs up the residual air in the alveoli and in early tuberculosis the following inspiration gives us a distinct moist rale we can get in no other way. Sometimes we will hear a fine rale right on the heels of the cough, what Dr. Knopf calls "post tussic suction." These rales are practically pathognomic of tuberculosis, and we will not hear them unless we make the patient cought, and we often hear them in what would otherwise appear to be a normal lung.

Now, if we have examined our patient and find his lungs apparently clear, are we justified in telling him he is free from consumption? We certainly are not so justified, provided any of the constitutional symptoms we have mentioned before are present. These demand treatment and diagnosis and it is not sufficient to dismiss them as non-tuberculous in origin because we cannot ratify them on physical examination. There becomes necessary then a period of careful observation. During such observation two things are essential, a weekly record of weight, noting stability, pains or losses, and second, a daily temperature record taken preferably at 10 in the morning, and at two and four in the afternoon. This should be done for not less than ten days or two weeks, and longer if circumstances warrant. It is usually possible to instruct a patient how to take his temperature accurately and he can then be given a blank form to fill in. If there is cough or clearing of the throat with expectoration, numerous examinations of the sputum should be made. If these continue negative, and there is still doubt or suspicions in our minds, we should, if possible, have some of the sputum injected into a guinea pig.

Tuberculin tests are valuable only when their limitations are clearly understood. As nearly all adults will give a positive Von Pirquet test, we can realize how narrow these limitations are. None of the tuberculin tests will tell us whether the reaction is due to an active or clinical tuberculosis, or to a latent or healed lesion not demanding treatment. In children the Von Pirquet and Morro tests are valuable aids when all the other circumstances surrounding the case are clearly understood. In any event a tuberculin test should never be made an excuse for neglecting the routine procedure that we have referrrd to under history, examination and observation. The complement fixation test offers us some hope of being able to thereby distinguish between clinical and non-clinical tuberculosis, but it is not yet generally available nor have its limitations been accurately defined.

If our observation of the patient shows no improvement of the symptoms, or if we note a continued loss of weight, though slight, or a rise of temperature in the afternoons; or, if the pulse is persistently rapid, we are justified in calling that patient tuberculous, or probably tuberculous, as circumstances may warrant, even though we have found his lungs apparently clear and his sputum, if any, free from bacilli. We have probably been prone to lay too much stress on physical examination and not enough on symptoms. As Lawrason Brown has stated, "Symptoms are a better and more accurate guide to activity than physical signs. Symptoms without physical signs demand treatment, while physical signs without symptoms require only careful watching." If we will just consider the proposition for a moment we will see the necessity for applying this rule. On the inside of our program there is a statement that there are 500,000 consumptives in the Mississippi Valley. How many of these are receiving treatment for cough, bronchitis, indigestion, asthma, nervousness or kindred complaints? And because often they were not thoroughly examined when they first applied for treatment, or because their symptoms were not properly gauged and observed. In the early cases it is probable that this latter is of the greater importance.

THE BACTERIOLOGY OF THE SO-CALLED INTESTINAL INFLUENZA.*

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It appears that there has been present in many parts of the country during the past winter, a peculiar form of epidemic gastro-enteritis that, according to reports I have been able to gather, has been widely conceded to be an intestinal form of influenza.

Ever since, however, the widespread epidemic of 1889-90, when influenza first became universally known under this name, there has been a great tendency, both among the men of the profession and among the people in general, to apply the name influenza to every otherwise unexplainable condition coming during the time of the year when influenza is usually prevalent.

Literature presents us with technical names for the disease corresponding to practically every important organ or viscera of the body. Through the absence of bacteriological proofs, however, there has always been a great question as to whether influenza after all has anything to do with some of these conditions.

In this particular instance, through my laboratory investigation of the epidemic here, I am in a position to state that in those cases that came under my observation, whether or not the influenza bacillus had anything to do with provoking the disease, through possibly being located elsewhere in the body, there was also present another organism, in a local infection of the intestinal tract, and that this organism alone, according to animal experimentation, can produce all of the characteristic symptoms that were commonly present in the cases.

Clinical Course.—The precipitation of the epidemic was most abrupt and could easily be likened to the sudden springing up of epidemic influenza, such as the country has experienced from time to time. Practically without any sporadic cases, there was a sudden outbreak in which a hundred or more cases came under the observation of physicians within a period of twenty-four hours. It has been conservatively estimated that during the three weeks the epidemic lasted, about ten thousand people of this city alone fell victims to the disease,

The onset of individual cases was practically without symptoms of a prodromal nature. While some patients experienced a previous feeling of malaise for a period of several hours, in most instances there was a sudden feeling of extreme

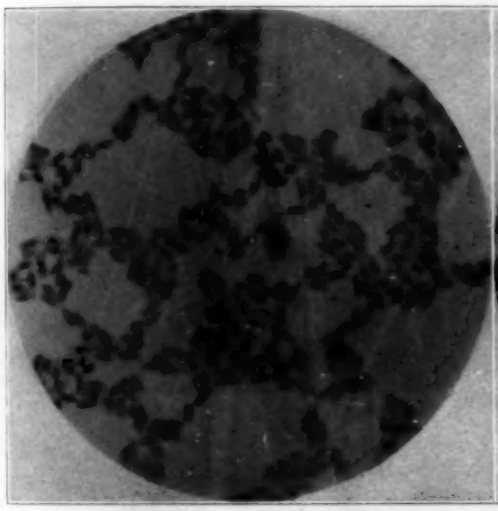

Fig. 1. Bacillus of Winter Cholera, Showing Peculiarity of Staining of the Organism, in First Culture, Following a Long Period of Saprophytic Existence.

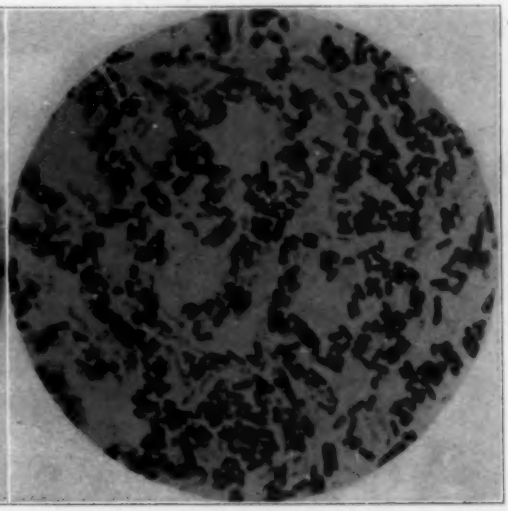

Fig. 2. Bacillus of Winter Cholera, Showing Uniform Staining of Entire Organism.

*Read before the Fulton County Medical Society, July 5, 1915.

depression in the region of the stomach and a growing weakness all over the body. Along with this there was a clammy condition of the skin and the breaking out of cold perspiration.

After a few moments, in which these symptoms reached their highest intensity, the feeling of depression in the region of the stomach gave way to a feeling of nausea and was followed by a most explosive form of vomiting; vomiting entirely unlike any other form of vomiting, but as though the stomach was thrown into the most intense convulsions. Simultaneously, there was the same convulsive actions of the bowels. In many cases the patient was unable to reach the bath-room before completely soiling himself.

that these acute symptoms were usually entirely without abdominal pains. Also, in most instances, after the first gastro-intestinal storm was over, the patient felt perfectly well. No impairment of appetite; the patient starting out to eat well, and anything he desired, without any ill effects.

A very small per cent, however, seemed to run into a sort of a chronic state and ended in a typhoid-like condition with a period of fever and other symptoms simulating typhoid. Though very threatening in the beginning, owing to the abrupt ending of the disease, it was not fatal. Only one death was reported as a direct result of the infection.

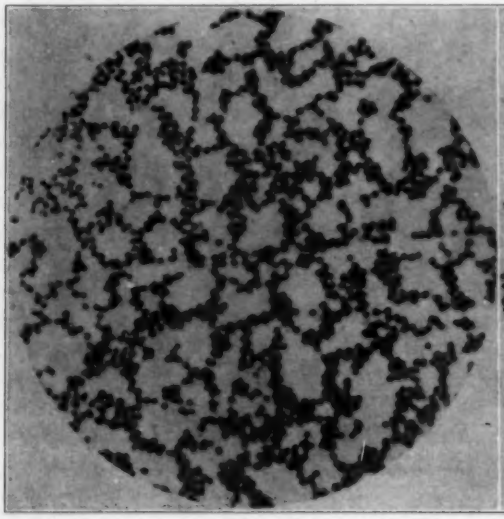

Fig. 3. Bacillus of Winter Cholera, in Culture Following Animal Inoculation.

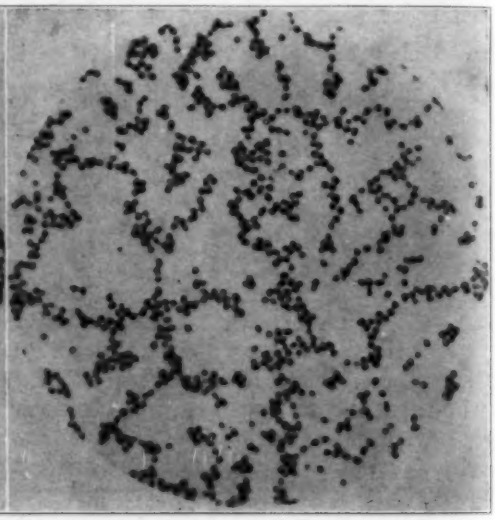

Fig. 4. Bacillus of Winter Cholera, in Culture from Cholera Stool.

Just what the temperature and pulse was at this crisis of the cases, I am unable to say; for the disease was so abrupt in its nature that the physicians had little chance to reach any of the cases in this early phase. However, the patients described all symptoms of collapse; some expressing it, they never had been so sick in their lives before as they were for a little while.

From twenty-four to thirty-six hours was usually the period of these intense cholera-like symptoms. During that time there were attacks at varying intervals of vomiting and purging, purging and vomiting. In some cases there was no purging and also in some there was purging without vomiting. One of the striking features was

Cause.—The finding of a cholera vibrio that morphologically resembled the true cholera organism was reported by one laboratory. This organism, however, was present in very small numbers and when isolated and put to the test of producing similar symptoms in any of the laboratory animals, it proved entirely harmless.

Other reports came of the finding of the well known Shiga's bacillus; this was, however, not borne out by the clinical manifestation of the disease. In no way did it resemble the summer diarrhea or any of the dysenteric-like conditions caused by the bacillus of Shiga or any of the Flexner-Strong group. Instead of assuming the aspect of anything that could be taken for a

dysentery, running over a more or less prolonged course and resulting in the grave intestinal lesions, such as are often produced by the ameba itself, or in like manner by the bacillus of dysentery, the aspect was distinctly cholera in character, or that of an acute poisoning; coming and doing its worst and passing off again within a very short time.

Bacillus of Winter Cholera.—Through the keeping of a number of the stools of patients affected during the epidemic and through repeated bacteriological examination of the city water and sewerage, I am sure that I have succeeded in isolating the specific organism of this disease, which organism, I am also sure, adds to the list of our present known pathogenic bacteria an organism capable of producing cholera symptoms and yet does not belong to the vibrio or the spirillum group.

Morphology and Physiology.—It is an organism that is among the very largest of all bacteria, measuring from 2 to 2½ microns in width and from 5 to 8 microns in length. It grows singular and in pairs and has a great tendency toward plasmolysis, refusing to take the stain throughout the entire organism under various conditions, but stains irregularly in different manners.

It is not strictly parasitic, but one of those parasitic organisms able to lead also a saprophytic existence. Especially notable about it is the striking change of features it in some respects presents in passing from one to the other and at the same time leaving the question of its identity clear.

As a saprophyte, when grown on solid media, it produces a heavy red pigment. It is practically aerobic; there is only a slight growth in the absence of oxygen, and these cultures produce involution forms of many odd characters. It does not ferment glucose; acidulates milk after three or four days, but does not coagulate. It liquifies gelatin, is non-motile, and is decolorized by Gram's method.

Following animal inoculation, it loses its pigment producing property and takes on a peculiar feature in regard to staining. It now stains more like a large diplococcus than a bacillus, which appears to be due to plasmolysis of the organism. Close study of smear preparations reveals that the deeply staining bodies seen are enclosed within an outer membrane, corresponding to the original morphology of the organism.

After having become parasitic, it acidulates milk more markedly, but again does not coagulate. It also grows somewhat better in the absence of oxygen and ferments glucose. Gelatin is liquified as before. It does not produce indol, neither as a saprophyte nor after having been passed through an animal.

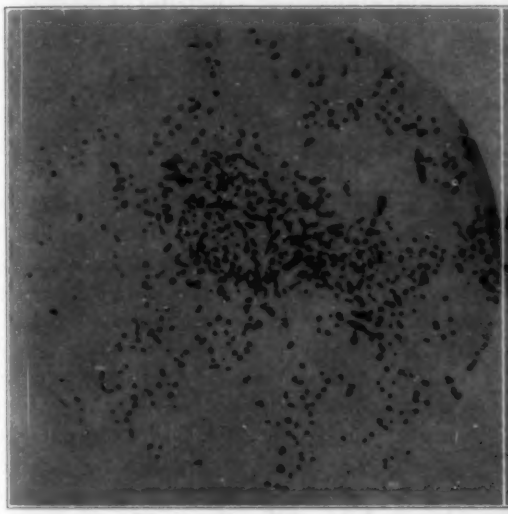

Fig. 5. Bacillus of Winter Cholera, Showing Effect of Plasmolysis Upon the Organism of Fig. No. 2.

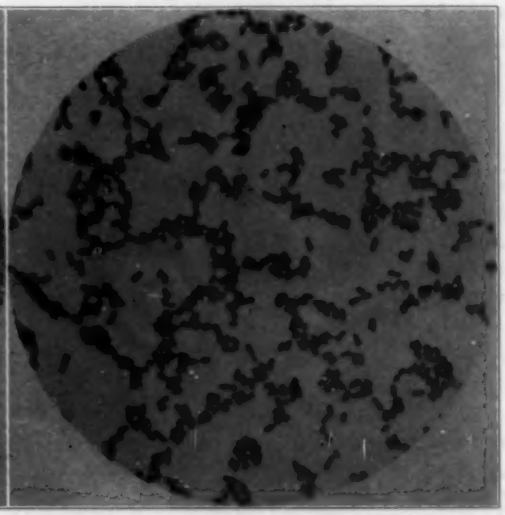

Fig. 6. Bacillus of Winter Cholera, Showing Effect of Anaerobic Culture of the Organism of Fig. 4.

In both cases the colonies are alike, excepting on one hand they show the beautiful red pigment while on the other they do not. The colonies on plates where allowed to grow singly are very large, elevated and moist. The ordinary incubator temperature of 37 C. is not the most favorable one for cultures to grow in. They grow well at this temperature for the first six or eight hours, but after this they become more luxuriant when transferred to room temperature.

Pathogenicity and Animal Experimentation.—I found the organism present in all the stools that came under my observation from the patients of the cholera-like epidemic, and in some cases in very large numbers. In two cases I obtained almost pure cultures, and these could be obtained from nearly all after they had been allowed to become old. A small particle on a loop spread over the surface of an agar slant, produced practically no other growth than the characteristic one of the cholera organism.

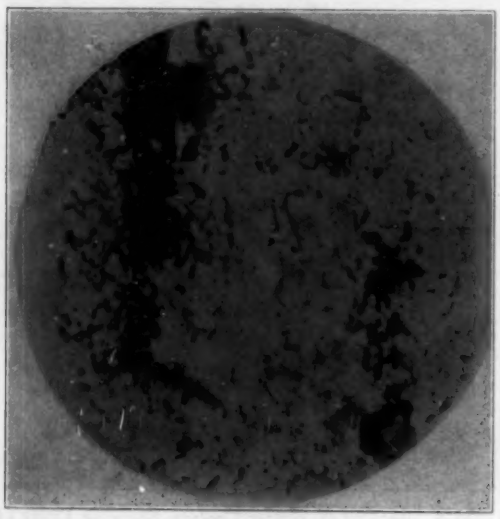

Fig. 7. Bacillus of Winter Cholera in Smear from Cholera Stool.

Animal experimentation brings out quite an interesting feature in regard to the pigment producer and the organism after having produced the disease. In the first case, it produces the characteristic symptoms only after an incubation period of about ten days, while in the later it produces them directly within twenty-four hours. It appears that the pigment producer is of very low virulence and has first to gain some foothold in the body and here attain a higher degree of virulence before it can actually produce the disease. That this is also the case is shown by some of the experiments I have conducted.

Guinea Pigs Nos. 1, 2, 3, 4 and 5.—All were inoculated into the peritoneal cavity, with about two cc. of a normal salt suspension, each containing a platinum loop full of the pigment producing organism from an eighteen-hour culture. This was followed in all the animals by a six-hour period of depression, such as might follow, however, the injection of many other organisms. Within two days, however, all showed signs of intestinal disturbances, manifested by the peculiar red or whitish red color of the feces. This continued for two or three days, when it seemed as though nothing further was going to happen; but ten days later all were abruptly taken down with typical cholera symptoms and died within twelve hours after onset.

An apparently well animal would suddenly be seen crouching in a corner of his cage and it was plain that he was sick. Temperature taken now showed somewhat subnormal; between 97 and 98. An hour later diarrhea would begin and from this on the temperature would go lower and lower until at the end of six or eight hours it was found down to 92, 93 or 94. This varied somewhat among the five affected. Simultaneously with the fall of temperature, the diarrhea symptoms became more and more intense. Coma and convulsions followed in each case at this point of depression and death occurred from two to four hours afterward.

Smears made from the diarrheic stools showed the cholera bacillus present in large numbers. Mucous particles contained in places practically nothing else but large groups of the organisms. Plate cultures and subsequent pure cultures were made from all of these animals and kept for further inoculation.

Guinea Pigs Nos. 6 and 7 were inoculated into the peritoneal cavity, as before, with one cc. of a normal salt suspension containing a loop full of the subsequent cultures. These animals immediately became sick. About five hours following, they showed the characteristic signs of depression with fall of temperature. This took a rapid course from now on and soon reached the point

of 92 and 93. The animals died within twelve hours after the first signs of the disease appeared, and with all the characteristic symptoms of coma and convulsions present.

Guinea Pigs Nos. 8 and 9.—These were inoculated intraperitoneally with a very small amount of the organisms cultivated from the stools of one of the cholera patients of the epidemic. A colony was simply touched with the end of the platinum loop and rinsed in the usual amount of the salt solution, and this proved enough in both cases to produce all of the symptoms as before, with the fatal end at the usual time. Subsequent cultures were made from these animals as before and tried in others.

Guinea Pig No. 10.—This animal received the touch of a colony in about one-tenth of a cc. of normal salt directly into the circulation through the heart. Characteristic symptoms developed within three hours, and in this particular case coma set in very early and lasted for more than five hours before death. Temperature all this while remaining at about 92.

Rabbit No. 1.—This animal received the usual small dose of the virulent organism into the ear vein. The animal apparently was little disturbed during the first hour, but after this went rapidly into a state of depression and died in an attack of convulsions three hours following inoculation. It appears that rabbits are unable to hold out nearly as long as the guinea pigs do in the extreme state of depression produced.

Pathology Produced.—Autopsy of all the animals showed the same general conditions present, and the one feature evidently back of all other consequent pathology may be stated as follows: Whatever there may be about the cholera organism that produces it, there is either a marked rise in the osmotic property of the fluid contents of the blood or there is a marked lowering of the tissue resistance to the normal osmotic pressure.

As a consequence of this condition, the body cavities contain a large amount of fluid exudate and there is a corresponding depletion of the quantity of blood in the circulation. The appearance of the heart is very characteristic and such as I never have seen in any other post mortem condition. The muscular portion is contracted to a mere point, the auricles standing out very prominently beyond the ventricles. Blood cannot be obtained from the heart by the usual capillary pipette method; there never is more than a very small amount left and this usually has completely clotted.

The specific organism was recovered from the blood of all the animals that had been inoculated with the high virulent organism, while in those inoculated with the pigment producer and had passed through an incubation period, the blood cultures were negative.

Conclusion.—Through the foregoing experiments I believe I have covered the points necessary to justify the conclusion of a definite organism for a definite disease. I have isolated the organism from both an outside source and from the stools of patients affected and produced similar conditions in animals. From these animals I have made subsequent cultures of the same organism and produced the disease with it again in other animals.

Vaccines.—The action of killed organisms is practically the same as that of the live. A dose of 100,000,000 injected subcutaneously in the arm of an individual who has not already had the cholera-like disease, within a few hours, produced a general relaxation of the circulatory system and a fall of the temperature to 97.6 or lower. Gastro-intestinal symptoms followed within twenty-four hours, consisting of three or four very copious movements of the bowels, together with nausea and a feeling of weight in the region of the stomach. Blood count showed a leucocytosis of ten or eleven thousand, with the increase of the polymorphoneuclear leucocytes. Along with this there was an increase of from 500,000 to 1,000,000 of the red cells. Unlike the case of most vaccines, there was absolutely no local reaction at the site of injection.

Source of Infection.—The large number of individuals that became affected in so short a time naturally pointed at once to the water with which the city is supplied, although in many places where the disease broke out the water had not been used for drinking purposes. This however, does not rule out the possibility of infection through it; for being used in every house for some purpose, indirect infection would be equally as easy. I found the organism present in the water in numbers ranging from one to two to every 200 cc.

It is an organism of the sewerage; for here it was present in large numbers, and it is evident that from the sewerage it found its way into the city water. The sewerage of the city is carried off by a large, open ditch that in one place runs within 300 feet of one of the city supply wells. During the months of the winter, analysis of the water, that in turn came from the storage reservoir, showed an alarming increase of the number of colon bacilli present. The fact that the increase was during the winter, when growth in the reservoir naturally is the least, is of evidence that there must have been some direct sewerage communication.

I am much indebted to Drs. Wm. O'R. Bradley and Clyde A. Finley of this place for their assistance to me in direct connection with the laboratory, and especially for their work in observing the clinical side of the disease. I am equally indebted to a number of other physicians who have likewise shown an active interest in the infection and were kind enough to furnish me with material for examination from the patients, as well as with the clinical data they had gathered.

The fall of temperature produced by the organism in my experimental work was the most pronounced, and the coma the most typical I have ever seen produced in laboratory animals. In the light of these most striking symptoms of a cholera nature, it establishes the fact that whatever the cause may be, or however the organism does it, this property is not confined alone to the vibrio or the spirillum group, but that we have among the cholera producing organisms also a bacillus.

ROENTGENOLOGY OF THE SKULL.*

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Roentgenology of the skull is a field of distinct diagnostic value, and at the present time is not used as frequently as it merits.

In looking through the literature, one will find very little on the subject as pertains to the findings portrayed by the x-ray in affections of the head. However, through the patient co-operation of the internists, surgeons and especially the rhinologists and otologists who scrutinized the various shadows very closely, it was found that they could depend upon a proper interpretation in ascertaining a correct diagnosis. This has stimulated a scientific examination of the head with recognition of many inexplicable diseases.

It is not to be understood that roentgenography is at all times the only deciding diagnostic method, but the idea to be conveyed is that it should be a concomitant method of procedure. It is always desirable to get the physical, chemical and pathological findings, also the history, so that a careful examination for focalization can be made. This is especially desirable in affections that concern the internists and neurologists, a field that up to the present time is quite undeveloped and offers great possibilities.

Before the advent of the Roentgen ray, dependence was placed on inspection, auscultation and percussion and with little satisfaction.

By inspection we can determine the size and shape of the cranium and face, note if any bulging or prominences, but cannot say if the latter were due to thickening of the table or a vaulting with a possible thinning of same. If a pulsating tumor is present, is it due to extracranial trouble or intracranial disease. If effused and discolored with traumatic history, is it a soft tissue involvement or a fracture? If tumor with green color, is it a chloroma? If scalp has a blue tint on account of dilated veins, due to circulatory disturbances, is it a tumor of the soft tissues of the head or does an increase in the intracranial pressure exist?

Palpation occasionally reveals alteration in structure, any unevenness as elevations or depressions; but is it an exostosis or an extensive and deep reaching osteoma; or is it a developmental defect, or normal depression or elevation? Should we find pulsation or fluctuation, then what? Fluctuation is found in developmental defects such as cranial hernias (encephalocele), superficial ulceration (gumma and abscess), hematoma of the scalp after fractures and sinus pericranii (varix of diploic veins communicating with veins from the dura mater). We sometimes get pulsation over the mastoid region, due to enlarged emissary veins on account of small size of the jugular foramen. Sometimes a scar formation of the dura will give no pulsation, thereby hiding a possible defect in the skull. Compressibility of the skull is found in severe forms of rickets, pressure atrophy (hydrocepha-

*Read before Wilmette Physicians' Club, Jan. 28, 1914.

lus of high grade), comminuted fractures, formation of thin skull over hematomas, and tumor infiltration.

Percussion is equally unsatisfactory, only seldom does it give any information.

Auscultation can be credited with little clinical value. Murmurs may be present in intracranial aneurysm, narrowing of intracranial vessels, hydrocephalus, brain and skull tumors. The above resume of the physical examination shows the small value of the usual methods.

According to roentgenographic findings the subject can conveniently be divided into three parts. The first, dealing with the normal size, form and structure of the skull in the different ages, and also the varieties of skulls. The second part includes developmental errors (size and form anomalies, associated with disorders of growth); the structural changes of the bone following inflammations and new growths. The third part deals with pathological conditions of the brain that produce characteristic changes, especially signs of pressure, as indicated in brain tumor, epilepsy, migrane and psychoses.

The dimensions of the normal head are variable. The size depends primarily on the size of the brain. There is a definite relation between the size of the skull and the cranial contents. Reichardt found that the normal brain occupied 90 per cent. of the cranial cavity. Vierordt's tables give the weight of the normal adult brain as 1,000 to 1,800 grams, making an average of 1,400 and as average cranial capacity 1,540 c.c. The size of the brain and skull is greater in men than in women, and is larger in bigger individuals, although the skull is relatively larger in small persons. Racial differences also exist.

Several methods of reckoning the cranial capacity are extant, but owing to the fact that the thickness of the skull cannot be told, they are very unreliable. The thickness of the cranial tables varies from 3 to 8 m.m. in the same skull in different regions. The thickness of the skull is influenced by age, sex and racial characteristics. The roentgenogram of the head shows the thickness of the skull, in this way a definite capacity can be determined in conjunction with cephalometry.

The form of the head is dependent upon, first, racial and family peculiarities; secondly, on external influences. The racial characteristics are so pronounced that they are of anthropologic value. We have all observed the similarity of facial and cranial development characteristics of certain families. As regards external influences, we have those exerted in intra-uterine life and during delivery; also the habitual position of the head and body, especially in infancy.

Newmayer found that the post-auricular part of the head is larger than the pre-auricular. The post-auricular part grows up to the ninth and tenth years, while the pre-auricular grows until the 25th and 26th years. As a rule, the head attains rapid growth to the 7th year, then a period of quiesence ensues up to puberty, after which growth again proceeds.

Most sutures of the base are completely ossified at the first month; the spheno-occipital suture ossifies between the age of 13 and 21. The sutures are open to advance age, while those of the vertex are usually completely ossified at the end of the second year, although sometimes not until well advanced in years. These observations are important because we occasionally find a premature obliteration of sutures, more or less extensive. Consequently on account of the disproportion between the size of the brain and the capacity of the skull, we have pressure symptoms, viz., headache, epileptic attacks, psychic disturbances, nutritional impairment and affections of the special senses, especially the organ of sight.

The Roentgen examination reveals: first, the size, shape and capacity of the skull and variations. Second, form and details of base. Third, size and shape of sella. Fourth, the thickness and consistency of the tables. On account of thickness of skull one can recognize Paget's disease or acromegaly; on account of thinning, rickets, osteo malacia, dysostosis, micromelia, osteogenesis imperfecta and tumor infiltration. Fifth, the condition of the inner tables, viz., impressions, pacchionian villi, diploic veins and sinuses.

With reference to dimensions we have a classification of long headed and short headed races. In certain cases the features are characteristic; as orthognism and prognathism. Short heads are significant of the yellow race, contrary to the American type. Determination of the form is of great importance because it shows that in a low, long skull, we have the occipito-petale brain type, therefore the Rolandic groove slants backward and is located posteriorly; but with the short

head with high vault we have the fronto-petale type, here the Rolandic groove runs upward and is more anterior. For practical purposes the dimensions are as follows: length, 180 mm.; breadth, 146 mm.; height, 135 mm.

Many abnormal developments of the skull occur either in size, shape or structure. To understand this, one must remember that the face and base are developed from cartilage, while the cranium is developed from membrane. In early uterine life centres of ossification develop, these enlarge gradually, ultimately displacing the cartilage and membrane; we find sutures showing the demarcation of the different bones; the basal sutures are often closed at birth, while most of the others close within the first year of extrauterine life. The sutures remain distinct and separate even after adolescence. The necessity of this is understood for allowance must be made for the growth of the brain. Many disorders of development are due to premature or delayed ossification.

The fact that the skull is developed from both cartilage and membrane makes it comprehensible that disorders of growth or of ossification do not necessarily affect the entire head, but if we have systematic bony disturbances we are very liable to have the facial and basal bones involved, for they are analogous, while the bones of the vault need not be affected.

From an etiological standpoint we have two large groups of form and size anomalies to differentiate. In one, anomalies of cranial contents; in the other, primary disturbances of growth of the bony skull.

We can classify them according to, first, malformations of skull due to development, such as congenital defects, clefts, fusion, ankylosis and double monster. Second, intracranial changes as microcephaly and megalocephaly. Third, those due to premature synostosis. Fourth, external causes as pressure and tension, scoliosis, kyphosis, ciatricial contraction, disturbances of growth due to central or peripheral paralyses, involving the head and neck. Fifth, systemic conditions, viz., micromelia, dysostosis, cleido-cranialis, etc.

Under inflammations of the skull we have acute osteomyelitis, syphilis, tuberculosis, actinomycosis, phosphorus necrosis, etc, Acute osteomyelitis is seldom an initial disease, but follows metastasis, due to infections of other parts of the body; such as smallpox, typhoid and influenza. In influenza we get localized inflammation or productive osteitis and periostitis. Osteitis frequently follows wound infections or sinusitis. Acute osteomyelitis most frequently affects the frontal, temporal or parietal bones, seldom the base. The Roentgen picture can, in many cases, tell if osteomyelitis exists, and if so, to what extent; also if traumatic history or sinusitis is present, we can locate cause and seat of trouble.

Under chronic inflammatory processes we find principally lues, tuberculosis, actinomycosis and phosphorus poisoning.

Syphilitic evidence presents itself most frequently in the facial area and the cranial vault, seldom the base; if so, then the sphenoid is most often affected. The growth of syphilitic granulation tissue usually originates from the periosteum, dura, mucous membrane or bone marrow. The skull may be affected in any stage of lues. In the early stage, sometimes the external surface of the frontal, temporal and parietal bones presents swellings, due to granulation between bone and periosteum. The adjacent bones show the presence of osteo-porosis, the external table shows marked grooving, the narrow spaces for the diploic veins are enlarged, due to rarefying osteitis. The tophitic areas frequently heal and leave osteophytic deposits, so that eventually we get a thickening of the outer table (exostosis), finally developing into ossifying exostosis. In later stages we get gummatous formation, especially in the frontal, temporal or parietal regions, sometimes the occiput is involved; it may be located in one or more regions. In the early stage we have foraminal cup-shaped defects with sharp outlines, later osteoporosis, finally may get sequestrum of the tables. Even in the late stages we will find attempt towards repair, so that we get evidence of osteophytic deposits and sclerotic thickening. In the first place we may get a large area of osteoporosis and brittleness, secondly, on account of periosteal and endosteal inflammation we get new bony growth; we may get here and there eburnating tendency with sclerosis of the diploe, associated with marked thickening of the skull. Hereditary syphilis manifests itself by ulcerative processes, similar to the acquired; by disturbances of growth of the sutures and joints or hydrocephalic cranial enlargement.

In the fields of otology, ophthalmology, rhinol-

ogy and odontology the Roentgen examination is of inestimable value.

In otology we can recognize malformation (artresia congenita); injuries, (fractures); foreign bodies; inflammatory processes, such as mastoiditis, destructive processes, viz., sarcoma, chloroma, carcinoma, cholesteatoma, caries, and hyperostoses.

In ophthalmology we can observe the presence of intracranial processes; sinus diseases; injuries, foreign bodies, form anomales, destructions and hyperostoses of orbital walls.

Rhinology offers a very extensive field. The accessory nasal pneumatic cavities are so often the seat of disease which can not be definitely located or the extent of which cannot be satisfactorily demonstrated outside of a Roentgen examination, that a diagnosis without the assistance of the Roentgen rays is considered incomplete.

The following facts can be shown: First, size, shape and position of the cells. Second, absence of sinuses or presence of rudimentary ones. Third, presence of anomalous cells; viz., recessus frontalis, unusually large bulla ethmoidalis or sinus septum nasi, etc. Fourth, the presence of intercellular septi and their probable interference with drainage. Fifth, nature of the inflammatory or destructive process can often be shown. Sixth, tumor formation. Seventh, extent of involvement.

In odontology we can recognize alterations due to constitutional affections; injuries (fractures, foreign bodies, etc.); unerupted teeth; inflammatory processes (caries, osteomyelitis, abscess); tumor formations such as carcinoma, sarcoma, granuloma, osteoma, osteofibroma and cysts.

In the foregoing paragraphs I have only attempted to briefly state the comprehensive usefulness of the roentgenologic examination, and it is gratifying indeed, to be able to reach a more scientific conclusion, thereby enabling the profession to produce more satisfactory and permanent results.

25 E. Washington Street.

THE ETIOLOGY AND DIAGNOSIS OF BRACHIAL PLEXUS LESIONS.

George W. Hall, M. D., Chicago.

The brachial plexus is essentially formed by the union of the fifth, sixth, seventh and eighth cervical roots and the first dorsal. These five roots form the three primary plexus branches and through renewed union and decussation of their fibers, three secondary branches, a lateral, median and posterior branch are formed. The fifth and sixth cervical roots constitute the upper trunk of the primary branches, the seventh cervical, the middle trunk, the eighth and first dorsal, the lower trunk.

A number of short branches are given off from the upper trunk to supply the shoulder muscles. Although fibers from more than one primary root unite to supply the muscles of the arm, the motor supply to a definite group of muscles depends for the most part on one of the roots. While the brachial plexus is thus more or less universally constructed, there are individual variations from this construction and association as recorded in the extensive literature on the subject. For example, the posterior cord may be made up of primary fibers springing directly from the cord instead of being formed from the primary branches, as is the rule.

The following anatomical classification of brachial plexus lesions may be made which is a modification of that of Grenet: (1) Paralysis of the primary nerve roots; (2), paralysis of the plexus proper; (3), paralysis of the terminal branches or individual nerves.

Paralysis of the roots may be subdivided into

(a) Intra-rachidian (intraspinal).

(b) Extra-rachidian (extraspinal).

Again, depending upon which of the primary branches are injured a paralysis of the roots may be classified as follows:

(a) Superior type (Duchenne-Erb type), (upper trunk).

(b) Inferior type (Derjerine-Klumpke type), (lower trunk).

(c) Total plexus paralysis (all three trunks).

That portion of the brachial plexus beginning with the formation of the primary branches by the union of the five roots and extending outward to the branching of the terminal nerves is regarded by Grenet as the plexus proper, which he divides into segments.

(a) The first segment includes the primary trunks before the state of division.

(b) The second segment includes that part under the process of division and decussation.

(c) The third segment includes the secondary trunks, and

(d) The fourth segment includes the terminal branches and individual nerves.

Etiology. Mechanical injuries direct or indirect to the brachial plexus surpass in importance all other causal factors. While the nature and methd of producing these injuries have been written about a great deal and, as Sherren puts it, many fanciful explanations have been advanced and volunteered, such as compression of the trunks between the clavicle and first rib, or transverse processes of the cervical vertebrae, the real cause is *traction*. Horsley demonstrated the effects of traction on the plexuses and later his findings were substantiated by Guillian and also by Taylor. The latter has described in detail the production of birth palsies by overstretching and rupturing the nerve sheaths, fibers, and vessels of the nerves, producing marked cicatrices and resulting degeneration of the nerves involved.

Horsley states that the immediate lesion consists in tearing the nerve sheath with resulting hemorrhage and in more severe cases the nerve fibers may be severed, followed by the formation of fibrous tissue during the process of healing, thus preventing the regeneration of the nerves involved.

Traction may be made upon the arm, neck, or shoulder, including dislocations of the shoulder. This, of course, includes traction to the arm in obstetrical paralyses during delivery, and that portion of the brachial plexus receiving the brunt of the injury necessarily depends on whether it is head or breech presentation. The bearing of heavy weights upon the shoulder or even carrying heavy weights in the hand, forcible abduction of the arm, or maintaining the arm in an abducted position during operations are factors in the production of such paralyses. Less frequently knife wounds, bullet wounds, dislocated or fractured vertebrae, pressure on the plexus by various tumor growths including carcinoma, neuromata, aneurisms or glandular enlargements, contribute to the etiology of brachial plexus lesions.

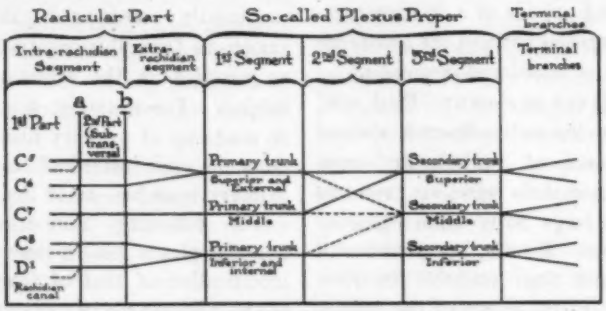


Fig. 1.

A scheme designed to show the Division of the Brachial Plexus into several segments.

(a) Line of exit at the conjugation. (b) Line of transverse processes. (External extremity)

In the rachidian canal, the anterior roots are shown unbroken, the posterior are shown as dotted.

In the second segment of the plexus, the anterior branches of the primary trunks are unbroken, the posterior are dotted.

Infections of the plexus following otitis, metapneumonic infections producing mononeuritis or polyneuritis are rather rare causes of brachial plexus lesions. Hyperelevation of the arm without violent traumatism even though it may be of very short duration can produce a decided lesion of the roots of the plexus. Scleroderma on the arm and thorax involving the eighth cervical and first dorsal roots has been reported. Cancer of the esophagus producing a bilateral brachial plexus lesion is also recorded in the literature.

A not uncommon cause of such lesions is the presence of a cervical rib or an exostosis, the so-called rudimentary rib. In such instances the fibers arising from the eighth cervical and the

first dorsal roots are most frequently affected. It occurs most frequently in women and while the ribs may be bilateral in most cases the symptoms, as a rule, are unilateral, affecting the right

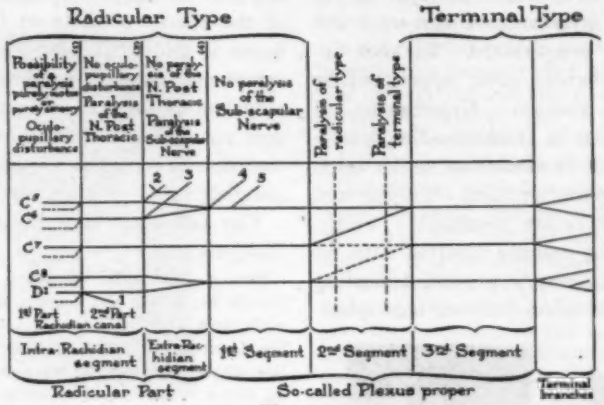


Fig. 2.

A scheme of the different forms of Paralysis of the Brachial Plexus.
(Regarding the division of the Plexus into segments, refer to Fig. 1)

1. Communicating branch of 1st dorsal with the sympathetic.- 2 Branch of the angular and of the rhomboid
3 Branch of the N. Post Thoracic.- 4. Sub-scapular nerve 5. Superior part of sub-scapular nerve.

side more frequently. Not more than five to ten per cent. of cervical ribs produce symptoms, and these symptoms come on usually during adult life.

Symptoms. The most frequent form of brachial plexus paralysis is the Duchenne-Erb type, which involves the upper or superior portion of the brachial plexus at its primary division. This

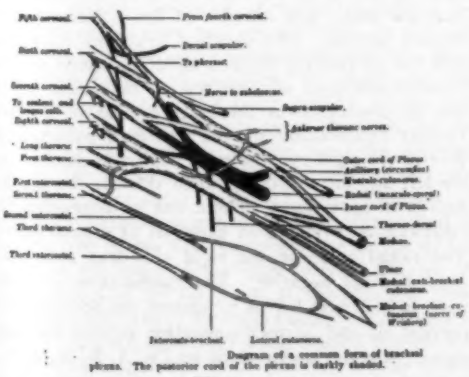


Diagram of a common form of brachial plexus. The posterior cord of the plexus is darkly shaded.

Fig. 3.

type was observed by Duchenne following difficult labors and by Erb in other cases, and christened by Bernhardt by the name type Duchenne-Erb. This form of paralysis corresponds to the paralysis of the fifth and sixth cervical roots. It may be the residue of a whole brachial plexus lesion which has become localized to these individual roots or the lesion may be confined to these branches from the beginning, as is often the case in obstetrical paralysis. The muscles most constantly involved in this type are the deltoid, the biceps, brachial anticus, supinator longus and supinator brevis. Less frequently the supra and infra-spinati muscles, and the pectorals are involved. The paralysis of these muscles have not all the same importance.

Motor Symptoms. The arm in this form of paralysis hangs motionless at the side of the body. The hand is in a state of pronation as the humerus is rotated inward. The point of the shoulder is elevated if the lesion does not extend high enough to involve those muscles of the shoulder supplied from that portion of the cervical plexus before the fifth cervical root is given off, which includes the trapezius.

Sensory Disturbances. First, I wish to state that in this form of paralysis there may be no sensory disturbances, although Rendu, and Raymond have established the constancy of the presence of sensory disturbances at the time of the injury, but state that they may rapidly disappear and when their absence is noted it is due to a tardy examination. The anesthesia when present is in the region of the circumflex and musculocutaneous distribution corresponding to the

fifth and sixth cervical roots, and perhaps including the seventh cervical root. These sensory disturbances are both epicritic, which is disturbance to light touch and slight degrees of temperature variations, and protopathic in character, which is disturbance of pain sense and extreme degrees of temperature. In such instances these disturbances cover approximately the same extent of surface. Experiments of Fieux have shown that in Duchenne-Erb paralysis the lesion is usually located distal to the union of the anterior and posterior roots. Trophic and vaso-motor disturbances are inconstant. Fibrillary twitchings of the muscles involved with reaction of degeneration may be present, depending on whether the lesion is complete or incomplete.

Fig. 4. A lesion of the brachial plexus on right side showing the elevation of the right shoulder.

Fig. 5. A lesion of the left brachial plexus, showing the elevation of the left shoulder.

The inferior radicular paralysis, the so-called Dejerine-Klumpke type, which is said to have been first described by Flaubert in 1827, results from lesions of the inferior or inner primary trunk formed by the eighth cervical and first dorsal roots. This type of paralysis includes those groups of muscles especially supplied by the median and ulnar nerves. It is frequently the residue of a total plexus paralysis and is the most common form next to the Duchenne-Erb type.

Symptoms. Most characteristic involvements are the paralysis, pain and atrophy of the small muscles of the hand, presenting in some instances the Simian hand. We find here atrophy of the thenar, hypo-thenar and interossei muscles which resemble somewhat the picture of a progressive central muscular atrophy. The picture of lower brachial plexus lesion is rendered more complete when the ramus communicans of the cervical sympathetic ganglion associated with the first dorsal root is involved. The paralysis of the dilator pupillae on the same side as the lesion is the result, giving the characteristic eye symptoms, namely, narrowed pupil, narrowed palpebral fissure and end-opthalmos. The pupil does not dilate to shade, but may dilate in most instances to cocain as the paralysis is not usually complete.

The following case illustrates this form of paralysis:

Mrs. L. C., aged 44 years, was referred to me March 28, 1912. She complained of weakness in the right arm and hand, pain in the right arm extending down to the wrist, even to the tips of her fingers. She also complained of numbness in the ring and little finger. There was tenderness over the course of the nerves; the hand became cold easily. At other times it felt hot. These symptoms were first complained of in January, 1912, three months previous to this examination. She stated that she had been able to do all of her own work until one month previous to the examination, since which time her pain was so severe that she had to have morphin administered upon her physician's advice because of the exacerbation of pain. Her personal and family history otherwise was negative. Beneath the nail of the third finger she complained of a sensation of smarting as though salt were present. She noticed at times a cramp in the fingers and hands, accompanied by a blanching of the fingers. She stated that the use of the hand caused it to turn white, and the arm to become cold. Examination showed a small trophic ulcer on the tip of the third finger of the right hand near the nail. The muscles of the forearm showed decided atrophy. The electrical reactions were sluggish but no positive reaction of degeneration present. Considerable pain was elicited on movement of the arm or pressure over the inner portion of the arm. Further examination showed narrowed palpebral fissure of the right eye, the right pupil was smaller than the left and did not dilate when shaded; the eye was sunken in appearance. There was no hoarseness and otherwise no evidence of paralysis of cranial nerves. The radial pulse on the right side was absent and chest findings negative. The combination of symptoms in this case led us to suspect the presence of a cervical rib and X-ray examination verified this diagnosis. She was operated on by Dr. A. B. Kanavel, a cervical rib was found, removed, and the patient made a very good recovery.

This case demonstrates the usual involvement of the brachial plexus due to the pressure from the extra rib.

Case 2. The second case, a man, aged 26 years, an iron moulder by occupation, was admitted to the service of Drs. Davison and Humiston at the Cook County

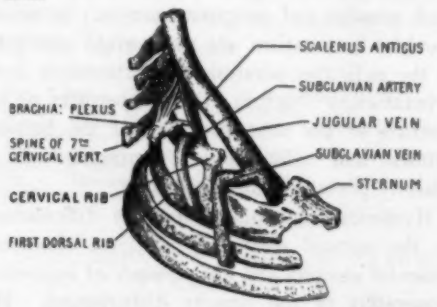
Hospital, on November 28, 1914, diagnosed as a cervical rib. The present complaint: Patient complains of pain in his left arm, shoulder, and side of the neck and face, becoming more severe when he gets cold. He states that his left arm and hand are weak and that he has pain in them when he attempts to work and

Fig. 6. A case of cervical rib on the right side showing the atrophy of the muscles of the hand.

finds it difficult to pick up objects with the left hand. His present trouble began about two years ago, at which time he was quite ill for two weeks, complaining of headaches so severe that he almost screamed, and accompanied with a high fever. At that time he had severe pain in the back of his neck. Since that time the left arm has given him more or less trouble. About one year ago he noticed numbness in the little finger of the left hand followed in turn by increasing numbness in the third, second and index fingers and the thumb in order. They felt cold and numb at times. At the time of our examination he complained of pain in the left shoulder and left side of his head and face. Inspection showed, as in the previous case, a narrowing of the left palpebral fissure. However, there was no difference in the size of the pupils. The entire forearm showed that there were disturbances of sensation to touch and pin prick extending over the outer portion of the left upper arm, the anterior portion of the chest to the nipple, and the posterior portion over the scapular region. There was marked disturbance of tactile, pain and temperature sense on the left side. The area of anesthesia extended upwards, including that portion of the left side of the face corresponding to the distribution of the fibers of the upper cervical nerves. A slight paresis of the right side of the face was present. The right arm in the region of the deltoid muscle showed fibrillary twitchings with decided dissociation of pain and temperature sense. The symptoms in this case involved the spinal cord proper. The important differential points were the dissociation of pain and temperature sense on the right side together with paralysis on the left side, which are the characteristic findings in cord lesions such as syringomyelia or hematomyelia.

Case 3. A. M., aged 50 years, Polish nationality, occupation given as laborer, admitted to the service of Dr. Rowan, Cook County Hospital, September 2, 1914, with the diagnosis of skull fracture. The following history was obtained: At 10:00 p. m., September 1, while partially intoxicated, the patient states through an interpreter that he fell down a flight of stairs, head foremost, striking one of the steps. He was not rendered entirely unconscious, but was unable to walk when he was picked up. He was taken home in a carriage and was able to converse very well and at that time he noticed that his left arm was very weak with slight weakness in the left leg. He entered the hospital with a diagnosis of cortical brain lesion.

Examination showed a scalp wound on the right side of the head. The left arm was completely paralyzed. The left pupil was smaller than the right, no evidence of a facial paralysis. There was a scar on the tongue which was the result of an old operation. There was apparently a slight depression in the skull near the laceration on the right side of the head. Upon cutting down no fracture could be found. Examination of spinal fluid showed a normal clear fluid under normal pressure. Blood pressure 146 mm. The X-ray showed no evidence of the skull fracture, nor fracture of cervical vertebræ. About ten days later I was asked to make an examination of the patient. In addition to the above findings, I found the left palpebral fissure narrowed; the eyeball sunken, and the left pupil smaller than the right. Beads of sweat were standing out on the right side of his brow, nose, face and neck, while the left side of his face was only moist. There was tactile and pain sense disturbance over the outer portions of the upper left arm and over the entire forearm. On these physical findings, in connection with a history of the case, a probable diagnosis of a lesion of the brachial plexus was made. The patient was dismissed from the hospital October 10 considerably improved. He was able to move the left hand fairly well, and showed very good movement of the fingers. The treatment was rest to the arm.



Note the angle of the cervical rib, the sharp bend of the subclavian artery behind the scalenus anticus, and the position of the vein and the pleura.

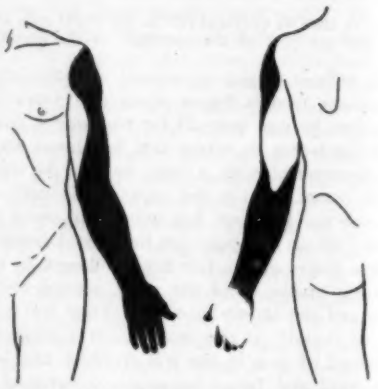
Fig. 7.

These three cases presented evidences of involvement of the cervical sympathetic under different conditions. In quoting Nauyn I wish to say that the sympathetic fibers do not always go

by way of the first dorsal root. They sometimes pass by the upper cervical root. Gegenbauer states that the sympathetic fibers pass normally through the fourth and fifth cervical roots to the cervical median ganglion. If his observations are correct then evidences of sympathetic involvement may be present, in some instances, in the Duchenne-Erb type of brachial plexus lesions. While the oculo-pupillary signs are not present in all cases of inferior paralysis or even in total paralysis their presence is of extreme importance as a general rule in locating the lesion to the inferior brachial region. In one of these cases there was evidence of atrophic disturbance on the end of one finger, as evidenced by a small ulcer formation, which coincides with the usual statements that trophic disturbances and vasomotor troubles are more frequent in the inferior than in the superior brachial lesions. Their presence or absence are in accordance with the gravity of the lesion. The sensory disturbances, aside from the subjective pain in the inferior form of paralysis involves the inner surfaces of the arm and the ulnar portion of the forearm corresponding to the distribution of the ulnar and to a less extent the median nerve.

Differential Diagnosis. It is self-evident that the etiology of brachial plexus lesions should be considered as an important aid in diagnosis. However, in every case there is a chance for error. The affections which mask the diagnosis are hysteria and organic maladies of the brain, cord, muscles and peripheral nerves. In cases of shoulder traumatism one must avoid attributing to the radicular paralysis the importance due to a luxation, a fracture of the tuberosity or to a fracture of the anatomic neck of the humerus. Clinical and radiographic examination will ordinarily prevent such a mistake.

Hysterical monoplegia may be differentiated by the normal electrical reactions, absence of muscular atrophy and the presence of segmentary topography of the sensory disturbances. Hysteria, however, may be confounded with paralysis of the terminal type of brachial plexus lesions, but ordinarily it does not confine itself to the region of distribution of one peripheral nerve. More often it extends over the region supplied by several nerves and in that way it may simulate a complete radicular paralysis. It also may simulate that rare type of brachial plexus lesion which is purely sensory, due to an intrarachidian involvement of the sensory roots alone. The personal and family history, the stigmata of hysteria and the various zones of anesthesia or hyperesthesia on different portions of the body, the narrowing of the visual field, serve as aids in the differential diagnosis. But these symptoms are sometimes wanting in hysteria, and it must be by examination of the paralysis alone that the diagnosis is made. However, the mixed motor and sensory paralyses of hysterical origin do not correspond exactly to the Duchenne-Erb or the Dejerine-Klumpke groups, but conform more exactly to the mixed radicular type. While hysterical paralysis is not often accompanied by muscular atrophy so may it be said that in slight plexus lesions there may be no



The distribution of the sensory loss after lesion of the brachial plexus (Head).

Fig. 8.

perceptible atrophy. On the other hand while electrical reactions are ordinarily normal in hysteria, the literature records a case presented by Rendu before the Societie de Medicine des Hospitaux (Paris), in which there was slight diminution of the faradic and galvanic excitability of the muscles involved and which did not prevent Ballet, Raymond and Babinski from agreeing on the diagnosis of traumatic hysteria even though sensory disturbances were absent. Rendu's studies emphasize the fact that in hysteria the sensory disturbances are more pronounced than the motor disturbances. Adamkiewicz describes under the name of "Monoplegia Anesthesica," two cases clinically characterized by anesthesia of a whole limb due to a primary

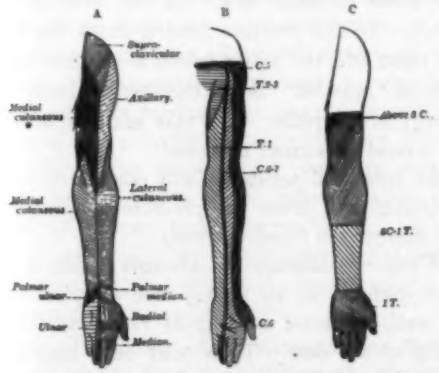
lesion of the posterior roots and bases his diagnosis of such an organic lesion on the absence of the general signs of a neurosis and on the presence of trophic disturbances. Rendu, Babinski and Freud substantiate this diagnosis by similar diagnoses.

Fig. 9. A lesion of the spinal cord proper, showing an elevation of left shoulder, similar to brachial plexus lesion.

Raymond emphasized one important point in the differential diagnosis, namely, that the persistence of normal sensation in a triangular area on the inner portion of the upper arm corresponding to the distribution of the internal brachial cutaneous branch which is given off by the second and third dorsal roots, speaks in favor of a plexus lesion. He considers this area of normal sensation as distinguishing between an organic and a hysterical lesion.

Medullary lesions must be carefully considered since cord lesions can complicate the radicular lesions, and there may be a concomitant cord compression or a secondary hematomyelia.

The gravity of the trouble and the presence of



Types of anæsthesia. A, peripheral (from Hasse); B, spinal, root type of Chipault (from Kocher); C, cerebral, umbilary type of Chipault (from Brissaud). (After P. C. Knapp, Tr. Amer. Neurol. Assoc., 1897.)

Fig. 10.

symptoms, motor and sensory, involving the opposite of the body as well as the lower limbs will ordinarily be sufficient to differentiate. Acute anterior poliomyelitis may be confounded with a paralysis of radicular origin when confined to one arm, but at the onset other members may be temporarily involved. The paralysis resembles usually the superior type of brachial plexus lesions, but the absence of sensory symptoms together with the possible history of an epidemic would be sufficient ordinarily to make a diagnosis. However, I might state that there is a possibility of an involvement of the motor fibers after leaving the cord, and under such circumstances it might be impossible to differentiate it. Such a paralysis clinically might be differentiated from an acute anterior poliomyelitis by the history of the case, the positive findings in the spinal fluid of an increased globulin content, and an increased number of lymphocytes in the latter disease.

Caries of the spine involves the dorsal more frequently than the cervical portion of the spine; pressure over the vertebrae ordinarily elicits pain; the spine is usually rigid; kyphosis may be present, with a possible localized pus formation. The symptoms are more frequently bilateral, associated with a temperature, and probable tuberculosis in other portions of the body. X-ray examination usually will show some changes in the vertebrae.

Meningomyelitis is most frequently of syphilitic origin and syphilis in other portions of the nervous system with the assistance of positive laboratory findings will usually make the differential diagnosis.

In rare instances, a hemipachymeningitis might be present to complicate the diagnosis of a pure brachial plexus lesion. I merely mention this as a possibility, in rendering the diagnosis of brachial plexus lesions difficult.

ILLUSTRATIONS.

Figs. 1 and 2. Modification of illustrations by Grenet.
Fig. 8. Taken from Morris' Anatomy.
Figs. 4, 5 and 9. From Raymond's Clinique des Maladies du Systéme Nerveux.
Figs. 6 and 10. From Turner and Stewart's Diseases of the Nervous System.
Fig. 7. Illustration from Keen's article in the Jour. Amer. Med. Sciences, vol. 138, on "Cervical Rib."

BLOOD-PRESSURE, FROM A CLINICAL STANDPOINT.*

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At present medical education puts much weight on physical and chemical methods for

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diagnosis, at the same time neglecting physics and chemistry as aids in treatment. Very marked progress in our science has been made in recognizing physiologic and biologic facts, or in findings claimed to be facts. This progress has created a sort of enthusiasm which is liable to interfere with that sober judgment without which we should never be. Clinical medicine is not a science of today or yesterday, or yesteryear. Its foundation was laid thousands of years ago. In those times people devoting their energies to our science were not blind or deaf. But the recent graduate, well drilled in the many new methods, is apt to assume that only the new is true and only the latest the correct.

Such statements may sound surprising when coming from one who has worked for some forty years in laboratories, in clinics and hospitals as well as in a somewhat extended, if not lucrative private practice.

We may define medical progress of our days as consisting in a verification of many older theories, reducing some vague general impressions to figures and numbers, and some of the theories to ciphers or zeros. We have not been successful all over the territory, for there are still "Christian scientists," Osteopaths, Chiropractors and what not, whose very existence should make us blush.

The great danger accompanying our recent progress is that of under-estimating careful and thorough clinical observation. All the methods available used in conjunction in a given case furnish, after all, nothing but a flash-light picture of a condition at a given time.

There is, with a very few exceptions, not one laboratory method, not one chemical reaction, biologic finding or physical determination which in itself, by virtue of its results, proves anything whatsoever, if not used in conjunction with clinical observation. It must, however, be recognized, that our new progress has furnished some wonderful aids to clinical understanding by either verifying or refuting a proposition.

A case in point is the study of the forces governing the circulation of the blood. The importance of a proper regulation of the blood-supply in health and disease is self-evident. That the blood-supply to the various organs varies with physiologic or pathologic conditions everybody knows. The dominating factors are little known. The contraction of the ventricles propels the blood through the arteries, rhythmically, the rhythm is discovered by the pulse-beat; it is lost in the capillaries and in the veins a steady flow is the rule.

Is the heart the only active part of the system? I believe not! It would seem plausible that the blood-vessels are themselves active in propelling the blood. Their walls consist of circular and longitudinal smooth muscle fibers, mingled with elastic fibers. We know only of sphincter muscles maintaining a tonic contraction which relaxes on occasions. All tubular tissues endowed with smooth fibers exhibit regular rhythmical contractions: the entire intestinal canal, the bile duct, the ureters, etc., changeable in energy and extent according to functional activity. An increased rhythmical contraction of blood-vessels is plainly visible in aortic regurgitation; the blanching and reddening of the tissues with each pulse-beat. The blanching means an active contraction, the reddening a dilatation of the smaller vessels. We must conclude that the contraction of the ventricle is followed immediately by a wave of contraction of the arteries, beginning at the aorta. This explains also the fact that after death the arteries are found empty; the last arterial contraction squeezed the blood into the veins. If the heart was the only active agent, the last contraction of the heart in death must fill the arteries with blood. To the pressure issuing from the heart we must add the active pressure exerted by the arterial muscles. Both together indicate the energy of the pulse. And this again is modified by several important agencies.

An increased resistance will raise, a decreased resistance will lower the pressure and influence the flow of the blood inversely.

When we measure the pressure which a current confined in an elastic tube exercises upon its wall, we know nothing as yet as to the velocity of the flow. There may be a high pressure with a slow current and a low pressure with a swift current, and vice versa. Therefore, determining the pressure leaves us in the dark as to the amount of function, the supply of pabulum to an organ and the washing out of waste products. Still we take it for granted that a great variation in pressure, shown by the rhythm of the pulse-wave and its systole and

diastole must favor an active flow, the progress of the blood. If this was so, a flabby wall, the cause of the dicrotic pulse, and an aortic regurgitation with its excessive variation of pressure would be ideal conditions.

This leads us into an inquiry as to the components of resistance. There is in the first place the normal tone of the elastic fibers in the arterial wall, as constant as that of elastic rubber, giving when stretched, contracting when released. Secondly, the variable tone of the smooth muscle fiber, now in steady contraction like a sphincter muscle, again perhaps in a semiparetic condition—flabby, or in great activity, when functioning. It is plainly shown in physiologic and pathologic anemia and hyperemia, under the influence of vasomotor nerves.

The vessels are imbedded in soft or in dense tissues, in the skin, the adipose tissue, muscles, where they are endowed with a thicker coat of smooth fiber, or in lungs, brain, osseous tissue. Whatever the surroundings, they offer a certain amount of resistance to expansion, e. g. during muscular contraction and in proportion to the amount of tissue juice; it is greatly increased in edema. It must also be potent during an increased activity of secretory glands.

Not only does the circumference, the immediate surrounding of a vessel offer resistance, also the periphery, the distal end, the walls of the smaller branches into which it divides, the capillaries. In disease we discover passive congestion, or an acute local anemia as additional causes of resistance. Inflammatory processes involve an acute congestion leading to a vascular condition analogous to an aortic regurge: capillary pulsation, felt by the patient when sensitive nerves are in close proximity to the inflamed area. It is due, of course, to an increased and purely local pulsating activity of the arterioles, accompanied by a retarded flow of the blood, exactly as in the "Bier hyperemia."

Another variation of resistance to the blood-flow and blood-pressure we find in the physical condition of the blood itself, in an increased viscosity—a thicker liquid flows more slowly—in an increase of red cells in erythrocythemia, a fall of pressure generally, but not always, in anemia. Plethora tends to increase pressure. Normal functional activity of glands elevates pressure with an increased flow. I enumerate these details to show that changes in pressure may be entirely independent of the force of the heart-beat.

Of the many other factors which may influence blood-pressure I will mention but one: the influence of the vaso-motor nerves. Their effect may be purely local, or systemic, or general. It may be due to a local, or a systemic or a psychic cause. According to our present knowledge we must take it for granted that all vasomotor action is in close connection with the internal secretions, in the first place that of the suprarenal glands, the adrenalin or epinephrin.

Blood-pressure is regulated in our organism in a way which is still clouded in much mystery. Most of the alleged facts are founded merely on hazardous theories. The relation between kidney-function, arteriosclerosis, valvular diseases of the heart, brain-pressure, mental worry, psychic depression and exaltation to blood-pressure are by no means elucidated; they require still much careful analytical study.

The simple recording of pressure findings without most detailed clinical data is a sterile undertaking, the more so, as our methods of obtaining blood-pressure are lacking in precision. The usual way of inflating a broad cuff placed around the upper arm, thus constricting the brachial artery and reading from some kind of manometer the amount of pressure employed to just make the pulse disappear, is somewhat crude. We compress not only the artery, but also the veins, inducing a venous stasis with rising pressure; we press away an unknown, but certainly variable, amount of tissue-sap, we constrict the nerve-trunks and create uncontrollable nervous reflexes in the vasomotor system. And very frequently the whole procedure exercises a marked effect upon the mental condition of the patient also influencing pressure findings.

Finally, we determine by such methods the pressure, if anyway correct at all, in only one peripheral artery, in one extremity, far away from vital organs. That the pressure in some visceral organ of whose changeable blood-supply we are well aware, liver, intestines, lungs, etc., would be immensely more important to know, there is no question. How glad would we clinicians be, if we had a method to determine blood-pressure in the kidneys, or within the heart, providing it would indicate the energy of the flow.

And even the findings of pressure in one brachial artery may differ not only from that in the femorals, but even from the pressure in the other brachial, for instance, in aneurysm of the aorta, where it is almost pathognomonic. I have verified this in a large series of cases.

If, therefore, our estimations of pressure within the brachial artery possess only a limited value from the standpoint of methods of precision, they are of, I might say, enormous value, namely in the sense of comparative results in conjunction with the clinical aspect.

Mechanical contrivances to record blood-pressure are numerous. The manometer is either the mercury or the spring or diaphragm type. The latter is objected to by some as not reliable, because the spring might weaken. It can be compared, however, as to its accuracy very readily with any mercury manometer. Nor is the latter always quite reliable; when the glass wall is not perfectly smooth and when the mercury has a film of oxide floating on top, the momentum of the pulse-wave exaggerates the excursions of the mercury column. The spring instrument, which I employ now exclusively (the "Tycos") has certain valuable advantages apart from its compactness, etc. A close observation of the movements of the needle when compression is made very gradually discloses characteristics of the pulse much like the sphymograph does and recognized by the palpating finger only after considerable experience. The slowly rising pressure will reveal at one spot a quickening of the needle corresponding, it is believed, to the so-called diastolic pressure. We may now form an opinion of the character of the pulse-wave; we recognize dicrotism, alternation, delayed apex, sudden or gradual rise and fall of the waves. The extent of the oscillation is even more conclusive than in the sphygmographic tracing. I consider this feature of particularly great importance, after an experience gained from many thousands of sphygmographic tracings in my collection. The pulsus bisferiens (in aortic stenosis) which is hardly recognized by palpation, becomes plainly visible. On further rise of manometer pressure the excursions of the needle become smaller and tend to disappear. The impulse of the pulse-wave upon the proximal part of the constricting cuff maintains some small pulsatory movements and renders the determination of systolic pressure, namely the complete suppression of the pulse, quite indistinct. Either palpation of the pulse at the wrist or auscultation of the brachial artery distal from the cuff must be resorted to to discover systolic pressure. The vivid oscillations of the mercury column hide the details enumerated before.

To estimate diastolic and systolic pressure, both the tactile and the acoustic method should be used in every case, for there are many in whom radial pulsation disappears before the pulse sound at the brachial disappears, and vice versa.

Systolic pressure, as stated before, is obtained at the moment when the pulse wave vanishes. Evidently we have at this moment overcome by compression of the brachial artery the force with which the heart and arterial muscles have propelled the blood through this vessel.

Diastolic pressure is defined as representing the pressure prevailing in a vessel during diastole of the heart, or more correctly speaking: the pressure prevailing at the distal side of the aortic valves at that time. For when the aortic valves leak this pressure becomes at once very much lower, approaching zero. We discover a similar condition in sclerotic dilatation of the aorta.

In mitral stenosis we usually find a comparatively high pressure though the heart in consequence of the narrowing of the mitral orifice is poorly supplied with blood. A compensation has taken place due to increased tone of the arterial muscle favoring circulation. Here also diastolic pressure can only mean the one prevailing at the aortic valves.

While blood-pressure is identical with systolic pressure, pulse-pressure is understood to be the difference between systolic and diastolic pressure. It is grossly exaggerated in aortic insufficiency and frequently diminished when general pressure increases—a bad symptom!

A question frequently asked is, what should be considered a normal blood-pressure? It varies very much according to age, sex and a large number of circumstances and individual conditions. Within certain limits the rule that systolic pressure should be one hundred plus the age is approximately applicable. Thus a person 25 years old would have about 125 mm. Hg.,

with 50 years 150 mm. But a child of 6 years with 106 and a person of 80 years with 180 would be far from normal. By the way, the estimation of blood-pressure in pronounced arteriosclerosis must be done with particular care. In a rigid artery the condition of the sclerosed wall will offer resistance which is not due to the blood current itself. In a calcified artery, in a so-called pipe-stem brachial or goose-neck wall brachial compression may cause infraction followed by embolism and gangrene of the fingers. One must also be careful in cases with an excessively high pressure, when findings should be obtained quite rapidly. The powerful compression squeezes the nerve-trunks and cases of paralysis due to the method are on record.

Nephritis does not always cause high pressure, as some seem to think, nor does arteriosclerosis. It is highest usually in so-called hypertension nephritis, a chronic ailment that is at times amenable to successful treatment. Papaverin, iodides (sajodin), and diuretin give good results if taken for a long time in moderate doses, together with appropriate diet, which need, however, not be free from proteids when there is no retention of urea. Urgent cases are promptly relieved by venesection. Other conditions with high pressure are eclampsia (of diagnostic value!), all kinds of colic during the attack (e. g. lead colic) but usually not during the intervals and the initial stage of acute parenchymatous nephritis. Ordinary chronic albuminurias are not characterized by high pressure. I have not been able to verify the recent statement that in high pressures the pupils are dilated.

A very low systolic pressure occurs in all weakening and wasting diseases, in anemia, in dementia praecox, in Addison's disease (which is not always betrayed by bronzing of the skin) and as a rule in chronic myocarditis. Yet a weak heart does not always show low pressure. Pressure may be high though ventricular contractions are feeble, namely when there is an increased peripheral resistance as in cyanosis. In angina pectoris pressure is more often high than low. It is low, when visceral (abdominal) vessels are filled, a condition that may even lead to "bleeding to death into one's own intact vessels." A hypodermic of adrenalin is here the remedy; it contracts the visceral vessels and dilates the coronaries.

Diastolic pressure is lowest in aortic regurgitation, also in tuberculosis (pulmonary), and in chlorosis, in chronic anemia.

Pulse pressure, the difference between systolic and diastolic, is most marked in aortic insufficiency, in aortic sclerosis (rarely in aneurysm), in mitral leakage and in some cases of hypertension nephritis, where it is found at a high level, e. g., systolic 250 and diastolic 125, a difference of 125 mm., while the average pulse-pressure may be stated to be about 40 mm.

Pulse-pressure is low in aortic and mitral stenosis, in most all congested conditions, in plethora, etc.

But all such statements and figures should be accepted with great reserve, for an individual equation is much in evidence. It is after all only the clinical aspect in a given case which can decide if a pulse reading means disease or health. It is wrong to generalize in such matters, we must individualize. We must consider carefully whether a high pressure is not necessary to maintain good circulation, or whether it threatens danger from apoplexy or hemorrhages somewhere.

We should diagnose the patient rather than the disease.

Modern medicine offers an almost bewildering multitude of methods for diagnosis. But the most ancient ones, inspection and palpation, are still the most important. We must learn to feel with our eyes and to see with our fingertips, which as far as the pulse is concerned is a lost art. And only too often are the newer methods used to impress the patient with awe. Be careful! It is much easier to suggest disease than to suggest health. Whatever methods you may apply, be proof against self-suggestion and self-deception.

The sphygmomanometer, if not judiciously used, will be a deceiver and a fraud; if used with proper appreciation of its limitations it is one of the most welcome aids to our best efforts.

Metropolitan Building.

INTERPRETATION OF BLOOD FILMS.*

A. L. MANN, M. D.
ELGIN, ILLINOIS.

One of the routine features of up-to-date clinical investigation and the one which in many instances tells the whole story is the examination and correct interpretation of the morphotic elements which are to be seen in a properly prepared blood film, especially when supplemented by personal observations of the clinical manifestations, which latter feature is one of the convincing arguments favoring the performance of blood work by the physician conducting the physical examination of the patient.

It is conceded that such a requirement adds to the overload which the human medical dynamo is already carrying, but I hope to make it appear that it can be so simplified as to fully compensate the busy doctor for the little extra demand on his time.

In the systemic circulation the blood consists of plasma in which are floated the red and white corpuscles and blood plaques.

Normal red corpuscles are seen as circular, discoid, non-nucleated cells, which in well made films lie perfectly flat with an even surface and sharply defined contour unless mechanically deformed in the process of spreading, and varying in size from 6 to 9 microns (approximately 1/4,000 to 1/3,000 of an inch).

Leucocytes are the so-called nucleated cells; they range in size from 5 to 15 microns in diameter as usually observed in the dried film, and are of many varieties, some of which are regularly present in normal blood in the proportion of one white cell to about 5 or 6 hundred red cells; when this proportion is seriously disturbed, or when other forms of white cells are present in any amount, a pathological condition is indicated. For all practical purposes they may be classed according to their size, morphology and staining proclivities into: small mononuclears or lymphocytes, large mononuclears, polynuclears, eosinophils, all of which are normal, and basophils and myelocytes, both of which when present indicate abnormal conditions.

Blood platelets, which in the fresh specimen resemble diminutive red cells, always appear in the film as masses or clumps of irregularly shaped bodies, 2 to 4 microns in diameter and always taking the basic stain. Their significance is as yet so undetermined that I consider them a negligible factor in film examinations.

The plasma, composed of fibrin and serum, is also of negligible interest in smears.

The first essential in obtaining films for examination is a properly prepared slide. A thin, clear, white glass slide, with ground edges, thoroughly cleaned with soap and water, rinsed in hot water, polished with a piece of clean cotton or linen—I prefer a piece of an old sheet that has been laundered until it has been relegated to the rag-bag—and finally flamed over a Bunsen or an alcohol flame, is to be preferred, and is what is ordinarily used; in an emergency, however, a piece of ordinary window glass cut to size 3x1 inches and prepared as above, can be used, but it will be found desirable in such cases to use a cigarette paper or a darning needle as a spreader to insure an even film.

In making the puncture a sterilized bayonet pointed needle will answer; puncture fairly deep and quickly; no previous stimulation of the capillary circulation by friction should be resorted to and the drop of blood should be allowed to exude without pressure; I have found that this result does not always follow the ordinary needle puncture, hence I use the spring lancet devised for that purpose, with very satisfactory results. Wipe away the first drop with a dry sterile cloth and collect the next drop *before it becomes too large,* on one end of the slide; then quickly touch the drop with the end of the spreading slide, NOT by placing the slide *over* the drop but by sliding it along the surface of the receiving slide *into* the drop which will quickly flow along the line of contact and can then be spread by drawing the superimposed slide evenly and quickly across the surface of the receiving slide; if this technique be properly executed the result will be a thin smear with no rouleau formation and few overlapping cells. I make it a point to make at least 2 smears; they are allowed to dry in the air and placed with the film surfaces in apposition until ready for staining and examination.

After 20 years of experimentation with various stains I have adopted the eosinate of methylene blue as a routine blood stain to the exclu-

*Read before the midsummer joint meeting of the Aux Plaines Branch of the Chicago Medical Society and the Kane County Medical Society, at Mooseheart, Ill., Aug. 11, 1915.

sion of all others; I prepare this stain by making separate one per cent. methyl alcohol solutions of eosin, water soluble, yellow shade, and Merck's medicinal methylene blue, and mixing them in equal parts in small quantities—say an ounce or two; flood the film with this mixture without any previous fixation for about one minute, then add a few drops of distilled water, carefully tilting the slide from side to side until the mixture is homogeneous; allow to stand for another minute or two, wash in distilled water and dry over a flame; the film is now ready for examination; if, however, accentuation of any particular elements may be desired, and especially if searching for malarial parasites, I again cover the film with Giemsa's stain for about five minutes and wash and dry as before; thus it will be seen that a specimen can be prepared for ordinary examination in less than five minutes and for malarial organisms in less than fifteen minutes; the slide can then be transferred to the stage of the microscope for examination with an immersion objective, thereby obviating the necessity of using balsam and a cover glass. I use, almost exclusively, a 1/12 glycerin lens, thereby saving much time in being relieved of the necessity of cleaning my objective at least every day, and I get very satisfactory results.

One minute's observation of the stained film will now demonstrate whether we have a typical or an atypical specimen to interpret; if the erythrocytes are fairly regular in size and shape, evenly stained and showing no nuclei nor intracellular organisms, we turn our attention to the leukocytes, making a differential estimate as we pass over the field.

In a normal specimen properly spread, under a 1/12 objective, they will not average more than one or two in each field, although at the terminal edge of the spread they may be found in groups of from ten to thirty; a little practice will enable the examiner to estimate whether there is any numerical disproportion of white cells indicating either a leukocytosis or a leukopenia which would require a blood count to fully determine; relatively, they will be found in the proportion of from 60 or 70 polynuclears to 30 or 40 mononuclears and 1 or 2 eosinophils; the protoplasm of the polynuclear cell is filled with a fine granulation, that of the eosinophil is *covered* with coarser granulation, both of which have an affinity for the acid (eosin) stain, while the cytoplasm of the mononuclear cell when exposed, displays a stippled appearance with an affinity for the basic (blue) stain.

A little practice on a few smears of known normal blood will so familiarize one with the general aspects of a typical specimen that any unusual appearance will at once arrest the attention of the observer and the problem of interpretation will begin. Atypical conditions present may be due to:

1. Artefacts—mechanical distortions due to imperfect technique.
2. Parasitic invasion.
3. Pathological cell degeneration or proliferation.

Artefacts appear as crenations, blisters, vacuoles, concavities, etc., which may be mistaken for the effects of chlorotic or pernicious anemia; sometimes a film is so impaired in this manner as to make it useless; extensive rouleau formation throughout the film likewise destroys its usefulness.

Parasitic invasion may be manifested by the appearance of bacteria or filaria interspersed among the cells or occasionally included within the cytoplasm of a phagocyte, or by the presence of protozoa within the cell itself. Bacteremia is rarely so pronounced as to present the organisms so numerous in a smear as to be readily detected and identified; in only one case in my career do I recall such a specimen, which was taken from a child in the incipient stage of typhoid fever, in which the typhoid bacilli in pure culture were present in abundance.

When clinical indications suggest the possibilities of a bacteremia a culture should be made. I have recovered the gonococcus in pure culture from 2 drops of blood taken from the little finger of a patient exhibiting a subacute arthritis of the knee joint but strenuously denying any specific possibilities; the blood findings compelled admissions, and subsequent puncture of the joint corroborated the findings.

Other *inter*cellular organisms such as trypanosomes, the spirillum of relapsing fever and filaria are easily recognized; the *intra*cellular organisms, of which the malarial parasite is the one of greatest immediate interest to us, are easily recognized when seen, but it sometimes requires long and patient search to demonstrate

them; only quite recently I spent two hours' time examining two films from a case in which malaria was suggested by the clinical symptoms, before being rewarded by finding two solitary but well defined specimens of the tertian organism.

It is the interpretation of cell proliferation or degeneration that our deductive faculties will be taxed to the utmost in attaining anything near accurate results.

A film displaying a marked paucity of red cells, and these being irregular in size and shape —microcytes, macrocytes and poikilocytes— would be interpreted as being suggestive of pernicious anemia; if many nucleated reds were found, especially megaloblasts, it would be quite within the bounds of reason to suspect a malignant condition somewhere within the system of the patient.

If the cells were fairly uniform as to size and shape but showing an excavated appearance owing to loss of hemoglobin, the inference would be chlorotic anemia; here, however, it would be necessary to differentiate carefully between an artefact and a true condition, which might require a count to determine.

The problem in both these cases would be to determine whether these anemias were primary or secondary, and it is here that a thorough comparison of the most careful clinical observations with the film appearances would be so essential to a conclusive determination, and is one of the reasons why the general practitioner should do this part of his own blood work at least.

A possible leukocytosis, or the opposite, a leukopenia, may be deduced with reasonable accuracy by one who has had considerable experience in this work, but more often it is the relative proportions of these elements that is of real diagnostic moment; hence we make our interpretations from the differential count, counting at least 500 leukocytes for each estimate. A polynuclear content above 70 percent. may be considered as a relative polynuclear leukocytosis, and when approaching 90 percent. is justifiable reason for suspecting the presence of confined suppuration; many other conditions will produce a moderate leukocytosis but in the presence of clinical symptoms unaccountable excepting on the hypothesis of pus formation the above interpretation is usually confirmatory.

A mononuclear content above 30 percent. is suggestive of tuberculosis or glandular hyperplasia.

A total absence of eosinophils is suggestive of typhoid; I also find that condition in senile debility and delayed recuperation from any severe sickness, so much so that it is to me always an indication of defective restorative ability.

On the other hand a persistent eosinophil content of 4 or 5 percent. or over, in the absence of any septic infection or parasitic condition, in an ordinary neurasthenic debility, is indicative of strong recuperative powers on the part of that individual.

An eosinophil content of from 10 to 70 percent. in the presence of a vague febrile condition resembling incipient typhoid, especially when accompanied by a facial neuralgia, is almost conclusive of trichiniasis; a moderate eosinophilia occurs in true bronchial asthma, some skin diseases (pemphigus, pellagra, psoriasis, etc.), parasitism, all ovarian diseases except cancer, some malignant conditions, etc.

Basophils have little or no significance.

Myelocytes indicate a disease of the bone marrow and when present in excess constitute the fatal condition known as spleno-medullary leukemia.

In conclusion: Equipped with a moderate priced microscope and a 1/12 glycerin immersion objective, a bottle of solution of eosinate of methylene blue and a few slides, the general practitioner can make his own film examinations in a very few minutes and he will not only be surprised at the information and diagnostic light which he will obtain thereby but he will also feel more than compensated for the little extra exertion required.

THE CONSTITUTIONAL INFERIOR INDIVIDUAL AND THE PUBLIC.

C. C. Atherton, M. D., Watertown, Ill.

Personal deviations from the regular course of mental development are considered abnormal only when they are of special consequence to the mental and physical life of the individual. This distinction is purely one of degree and is not to be confounded with eccentricities, which are often considered as being normal to the person. Eccentricities are simply an absolute predominance

of individual factors originating from structural brain anomaly, and are found associated with all grades of intelligence.

Constitutional inferiority, with which this paper has to do, is a term applied to certain forms, or more properly, certain groups of mental defectives, characterized by congenitally unstable nervous systems and particularly an unstable mental condition.

There is a large group of such morbid conditions which are considered mental deformities but which are not characterized by any definite pathological disease process, but are regarded as morbid because of a general deviation from the usual normal mental life. Defectives of this type are under sufficient control of themselves to be responsible, or partially so at least, for their acts. They are what might be considered as normal intellectually, yet are, nevertheless, deficient in that they show themselves incapable of co-ordination in their social relations with the public by which the normal person succeeds in overcoming the problems of life. There is an absence of that fineness of balance which is so manifest in the normal individual. Conditions in life, even though ordinary in character, are met only half heartedly and soon are abandoned for a less important and less strenuous occupation. There is an inability to adapt themselves to their environment. Inconstancy is the principal characteristic and it stands out so boldly that it is only too apparent even to the untrained and less scientific populace. There is a well marked feebleness of purpose, with an incapacity to initiate, decide, or inhibit. Will power, if it ever did exist, is pitiably weak.

Whether these unfortunates recognize their inferiority in comparison to the normal individual and try, in a way, to mask it, or whether their weakened will becomes exhausted, as yet remains an unanswered question. Whichever it may be, it is a fact, nevertheless, that they are indeed inferior and go a long way towards swelling the numbers in that great army of incompetent drifters of the human race—derelicts on the sea of human endeavor. Inadequacy is the keynote with them and they are totally unable to properly provide for their future. Those without a ready supply of funds and who of necessity must do something for a livelihood drift and wander from place to place, doing first one thing and then another, but never sticking to anything for a period long enough to derive benefit, except to get enough money to meet their immediate needs. Alcoholism, drug addiction and various other vices find in them ready victims. If they belong to a higher social grade than the average, where ready money may be had for the asking and a more or less unlimited supply, their tastes are somewhat more elaborate, but just as vicious.

This group of social dandies is not exceptional and sooner or later passes on into the paths of least resistance, into inferior and only too frequently questionable surroundings, with never a thought of the possible consequences. They abandon themselves to games of chance, to dissipation, revelry and immorality. Their mental make-up is such that this sort of riotous conduct finds fertile soil in their disordered brain, and the wildness of today gives to them no warning thought for the morrow. They fail to grasp or appreciate that which should go with culture and refinement and even the ordinary principles of common decency and good breeding soon fade into the background. Their intellect is such that they should know better, but it is well demonstrated in their morbid tendencies and in their daily conduct that they are inferior.

Public and private institutions have hundreds of these people, but by far the greater number are at large mingling and associating with the general public. When one of this type who has been in an institution succeeds in getting out, either by way of being regularly paroled or having escaped, he, as a rule, returns to his home and friends and for the most part gets along as well as the average for a time, at least, and the public never hears of him. If perchance he should go wrong and gets into mischief it is bad, but if some crime is perpetrated against society the fact is heralded all over the country and the calamity howlers set up a tirade of criticism and abuse against the institution authorities for carelessness and laxity in the conduct of their charges. On the other hand, prisoners are being daily released from the penal institutions because they have served their bit and public demands have been satisfied or, in recognition of their good behavior, their sentence is cut short and they are paroled. They are presented with a small sum of money, dressed in a new suit of clothes, and sent out into the world with a hearty

handshake and the good wishes of all. They are the proven criminals, degeneracy pops out all over them, yet they are shunted out into the world and sent on their way rejoicing, ready to begin all over again. Statistics prove that by far the vast majority sooner or later, and usually sooner, fall from grace and are found in their old haunts with the same old crowd and ready to do business in the same old way. Schooled in crime and most important of all defectives, with a cunning developed to a high degree from their life of deception, they are soon haled into police circles for fresh crimes and again sent to prison. Whether their crime was serious or not, it is only too frequently minimized and the fact that they are crafty, degenerate, dangerous beings seemingly makes but little difference, for when their time is up they are again allowed their freedom, by law, to go where they please and again try it all over.

The open door policy of these United States permits defectives to enter this country without much difficulty. The so-called literacy test, a bill to legalize the same having been introduced in the recent congress and which met with terrific opposition, would not by any manner of means correct the evil. The higher the education the more dangerous the defective. A sound mind and a healthy body are worth more to this country than an educated degenerate who can read and write and whose knowledge only serves to make him a cunning, lawless and slippery citizen, whose activities are principally limited to evading the law.

It is useless to further consider this phase of the subject other than to say we know beyond a question that these people exist, we know their peculiarities and their weaknesses and can describe them, and we further know that they are not normal and never will be. The vital question is, what are we going to do about it?

Newspapers, magazines and various other publications have taken up the subject and are devoting considerable space to it. Some of the articles are excellent, while others are not. For example, one occasionally sees in print where a defective child has been made normal by a simple operation on the eyes, a straightening of the same, or perhaps a correction of vision. This is purely a circumstance in the child, which may have made it so difficult for him to see that it was impossible for him to keep up with his class, and, as a result, fell behind in his studies. Defective vision and defective mental development are two distinctly and vastly different things and no operation on the eyes, regardless of its character, is going to put a new set of brains into any one's skull.

The eugenic proposition is another plan which was launched forth by many enthusiasts and which was supposed to do wonders, but for many reasons has not lived up to its reputation. It is quite likely that it would help some if it could be properly carried out, but unfortunately it is one of those near laws which cannot be enforced. The clean bill of health marriage certificate is fine so far as it goes, but it, too, has its limitations. It no doubt could stop diseased people from marrying, but how on earth could it prevent any of the type considered in this paper from doing so, providing their physical state was such as to pass inspection. It is a moral certainty that they would present themselves for examination all primed and ready for the examiner.

Sterilization of the unfit is another means which has been recommended and some states have laws in their statutes authorizing that this be done. This method would, to a slight extent, decrease procreation, but in my opinion would, to a very large degree, increase sexual disease.

To remove the conceptive elements of a defective woman and then allow her to roam at large would be almost criminal and certainly disastrous. Caution would become a thing of the past and her amorous nature would, in spite of all, assert itself. Men would continue to use her for evil purposes and as a carrier of venereal disease, syphilis, gonorrhea, and numerous others of a like nature, she would be the medium par excellence.

At a recent medical meeting held in this city a paper on this subject was read and I take the liberty to offer you a part of the same. "It is against the law to disseminate knowledge that may lead to birth control and yet we see everywhere about us insanity, imbecility, criminality, truancy and every degree of parasiticism and chronic invalidism"—"Birth control is of paramount importance in handling the tremendous social questions of the day."—"The stifling fumes

of our morally decomposing masses threaten our good homes and our nation," etc.

Considerably more than the above appeared in at least one of our most prominent dailies. The public, of course, reads, and knowing but the one side of the question, thinks it is a good thing, but is it? Would the sterilization of the unfit as a general measure do all that is claimed for it? Personally, I am of the opinion that it would not. Individuals who are subjects for an operation of this character must of a necessity be subjects for further care and observation, and as such, there is only one way to properly provide for them, and that is to place them in an institution and keep them there with such laws as would make this possible. No doubt this would be somewhat expensive in the beginning, but would be cheapest in the end. Notwithstanding all that has been said and done on the subject of defective mental development and its relation to the public, the issue remains a most vital one and is of paramount importance to all.

A SUBMERGING IN ASPHALT AT A TEMPERATURE OF 360° F., WITH RECOVERY.

O. F. Scott, B. Sc., M. D.,
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ARGO, ILL.

Patient, male, aged 21 years, was admitted to my service on April 7, 1914, because of a fall into a tank of asphalt in which the thermometer, at the time, and additional thermometers later, showed the temperature to have been 360° F.

Examination showed the patient to be completely covered with a thick layer of asphalt from the top of his head to the soles of his feet. The mouth and external nares were almost totally occluded. This asphalt was quickly detached in order to prevent asphyxiation. The asphalt, from the remainder of the exposed parts, was removed with extreme difficulty and showed first and second degree burns. There was a burn of the entire corneal surface of the left eye, on account of its having been open when the patient fell into the tank; the external auditory canals were also filled with asphalt. The clothes, upon being cut from the body could be made to stand like a suit of armor.

Under treatment the patient pursued an uneventful recovery as far as life was concerned.

Complications and Sequelae—The burns of the external portions of the anatomy cleared up without appreciable scars; the corneal burn without any defect of sight. The asphalt penetrating the left external auditory meatus, however, produced a severe purulent otitis media, which induced a perforation of the tympanic membrane. The otitis media persisted for three months. The perforation closed, after cauterizations, in four months with return of hearing. During the first few weeks, after the beginning of this purulent inflammation, a most peculiar swelling, or enlargement, of the peri-auricular tissues occurred so that the ear resembled the so-called "cauliflower" type. This enlargement disappeared during the course of three weeks, leaving only a slight permanent infiltration.

This case is only of interest in demonstrating the extreme temperature to which the body can be exposed with practically no permanent defects subsequently and without loss of life. The viscosity of the media is absolutely, in my opinion, the only factor that prevented fatal burns. Because, before the asphalt had time to penetrate the wearing apparel the patient was able to clamber up the side of the tank and the air striking the asphalt it ceased immediately to penetrate and congealed before body burns on the unexposed parts were sustained. Four months after the injury the patient was able to return to his former occupation.

It would be interesting to know just how many people in Chicago have learned that consumption, if taken in the early stages, is curable.

Plants will not grow and thrive in dark, ill-ventilated basements. Neither will human beings. Both need plenty of air and sunshine.

In paddling your own canoe toward the Harbor of Health, rocks are not the only things to avoid. Do not run into the other fellow's boat.

A tooth brush at home, one at the office, and another in a neat case for your best pocket are none too many.

It may take more than one swallow to make a summer, but only half a swallow of dirty milk can make a summer complaint.

—*From Bulletin, Chicago Department of Health.*

Dirty air is death.

* * *

Good air means good work.

* * *

Too much fresh air is just enough.

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NOVEMBER, 1915

Editorials

THE PATIENT'S STANDPOINT.

THE ILLINOIS MEDICAL JOURNAL does not often publish a paper written by a layman, although we frequently are importuned to do so. In this number, however, appears an article from Mrs. Sibyl Morris Teague, entitled "The Best Tuberculosis Prevention from a Patient's Standpoint," read before the Mississippi Valley Tuberculosis Conference, which we think should be published, not in a newspaper, but in a medical journal.

We do not agree with everything Mrs. Teague says, but she has spoken so truly on many points that every physician in Illinois should read what she, as a patient, has to say, and they should not only read, but they should also think of their patients having "Walking Typhoid," "Pleurisy," "Frequent Protracted Colds," "Bronchitis," etc., and determine accurately just how many of these patients have an incipient tuberculosis, or, possibly, a more advanced stage.

Far too many patients, suffering from tuberculosis, reach the second and even the third stage of the disease without a diagnosis of such condition, and it is not the fault of the patient either. Your patient has the right to your best diagnostic ability, and indeed has a much greater grievance, if you do not give it, than Mrs. Teague has placed against you.

HOSPITAL CONTROL AND EFFICIENCY.

The object of hospitals is primarily to care for sick people, and the efficiency of the hospital depends much on its ability to care for sick people in a manner satisfactory to those being cared for.

That hospitals are becoming more popular with the masses of the people there can be no doubt. Equally true is it that still more of the sick should be cared for in hospitals than is being done at the present time. It is undoubtedly true that a patient receiving the individual care which his case demands can be taken care of more comfortably and with far greater safety in a hospital than in his home.

In a large city, where the greater number of the people are not wealthy, the first question frequently put to the doctor, when he advises hospital care, is concerning the expense of hospital accommodations. Too frequently they do not take into consideration the doctor's fees. Hospital fees are payable in advance.

The second question put to the doctor is not concerning his charges, but can he attend the patient in some particular hospital. This is because of certain conveniences to other members of the family—possibly because the patient simply has a preference, or, as frequently happens, because of certain sectarian control of the particular institution. This question too frequently places the doctor in an embarrassing position. He wishes to please the family so far as he may, and at the same time secure for the patient the most satisfactory arrangements.

If the preferred hospital is one of the large institutions, run principally under the direction of and for the especial benefit of a certain few men who are on that particular staff, the family doctor, who may not be known at that institution, will be placed at a disadvantage. In a very short time the patient knows that the doctor is not a regular attendant there; in fact, is not known, and that a certain specialist of that staff is very successful. This too frequently breeds dis-

content in the mind of the patient or his relatives, particularly if the patient is not progressing toward recovery at a rapid rate. There is, perhaps, a natural feeling of loyalty in every nurse and intern of an institution for its staff members, but this, in many hospitals, is carried to an extreme, particularly in the large institutions.

Some institutions, where such treatment is accorded the family doctor, or the doctor who visits there infrequently, has not attained its maximum efficiency—no difference how high are its standards nor how good is its laboratory or other equipment. The hospital has not attained 100 per cent efficiency until each and every patient may be treated by the physician of his choice and may receive the same consideration shown to patients of staff members. The hospital has not attained its highest level until all patients receive individual care and attention, as against a routine procedure—as, for instance, it may be advisable to take the temperature of some patients at 4 or 5 or 6 o'clock in the morning, but certainly it is neither necessary nor advisable to awaken most patients, who possibly may have had a bad night, in order to record a temperature at that early hour.

In certain institutions much of the daily work is done in this routine manner—rather to accommodate the convenience of the attendants, not for the welfare of the patient. Routine practice in hospitals is no better than the empirical therapeutic methods of our predecessors of a century or so ago, and should be condemned.

Another practice which is to be regretted, and one which obtains to a greater degree in large institutions, is that of having much of the work done by interns. People employ a physician in whom they place confidence, and it is his duty to give his best service. Too frequently the busy surgeon operates and does not see the patient again, or, if he does, takes little or no interest in the subsequent dressings or management. Frequently a patient's well-being depends as much on after care as upon surgical procedure. In many instances the work which the physician delegates to the intern is in turn delegated to a nurse by the intern. This is not the service the patient is paying for, and the hospital is not giving a maximum service when these things are done. To say the least, the hospital patient is deserving of as much individual attention from his physician as he would have were he at home.

ACTIONS FOR CIVIL MALPRACTICE.

Fourteenth Article.

ROBERT J. FOLONIE, L.L.B.
CHICAGO.

The majority of suits for claimed malpractice are baseless in both law and fact. The greater number of them are abandoned before trial. How baseless they often are, may be illustrated by the case of Dr. M. The patient had a tubercular infection of the spinal column. She was attended at a clinic in which Dr. M. was prominent. A plaster cast was placed upon her and left for a considerable time. According to the claims of plaintiff this cast pressed upon the nerves supplying the uterus, which caused it to become diseased and rendered her sterile and incapable of performing marital duties. For this reason she was deserted by her husband and left destitute and deprived of her support as well as of important bodily functions.

The case was delayed for a considerable period and during the interval patient and her husband were divorced. She re-married and gave birth to a child. Upon discovery of these facts the case was promptly abandoned.

Dr. M., who was subjected to this suit never saw the patient or attended her in any way. She was, in fact, given attention by another physician and the reason for suing Dr. M. was because he wore a beard, and the physician who attended her in the clinic also wore a beard, which was proof conclusive to plaintiff's lawyer that he was suing the proper party, a beard serving as a badge of identification.

No moral is sought to be drawn from the fact that Dr. M. was adorned with a beard—but the situation illustrates upon what utterly foundless claims many actions of this character are brought.

I feel that I would not be performing my full duty to the profession, if I did not call attention incidently to the fact that many actions of the kind under consideration are the result of incompetent attendance and treatment by midwives.

Subsequent treatment by the physician resulting in a failure of cure has the not infrequent consequence that the entire ill-effects, real and imaginary, are laid at the door of the physician.

This is due to a very common conception, particularly among the foreign-born, that in her sphere the midwife is the superior of the physician. This feeling is so strong that even were it possible, it is entirely impractical to attempt to eliminate the midwife.

I am strongly impressed that a correction of this condition must rest in a legislative supervision of the right of midwives to attend confinement cases and that training schools and examinations of their qualifications be installed in connection with training schools for nurses.

I am impressed that this branch of the activities of the profession has been neglected and that the discouragement of the employment of midwives is on the whole inadvisable.

FIRST AID STANDARDIZATION.

A movement is on foot and a board has been appointed to study first aid problems, with the object of standardizing the methods, material and equipment employed in the administration of first aid to those injured in the pursuit of industrial occupations and in war.

The problems of first aid to the injured are large ones, and when methods and equipment are perfected, or at least have reached a reasonable degree of efficiency, many lives will be saved that are now sacrificed because of inability to properly give the aid needed at once.

The names of Surg. Gen. Wm. C. Gorgas, as chairman, and Dr. Jos. C. Bloodgood, Baltimore, as secretary, are guarantee that this board will study the entire question from all angles, and that its report will be of inestimable value.

The Secretary, Dr. Bloodgood, wishes it stated that he will welcome answers to the following questions from any surgeons of experience in the treatment of accidental injuries, and that these questions will receive the deliberations of the Board on First Aid Standardization:

FIRST MEETING, WASHINGTON, D. C., AUGUST 23 AND 24, 1915.

The following resolution was passed at this meeting: That the questions noted below be sent to the Chief Surgeons of Railroads, Mines and Manufactories, first, to be answered by them; second, that a copy of these questions be sent by the Chief Surgeons to their Associate Surgeons.

The object of these questions is to attempt to get the opinion and experience of a number of surgeons and to formulate them for publication.

Please answer each question on a separate sheet of paper and sign your name to each sheet:

1. What has been your experience with the most available first-aid package and dressing for small and large wounds?

2. What has been your experience with the immediate employment of antiseptics in accidental wounds; what antiseptic have you used, in what strength, and how applied? Have you employed tincture of iodine; if so, how and what have been the results?

3. What in your experience has been the most efficient and most readily applied method of fixation for injuries of the (a) upper and (b) the lower extremity?

4. Have you considered the construction of a stretcher, which, in addition to serving as a means of transportation of injured, will have appliances for the fixation of the upper and lower extremity, somewhat along the lines of a Bradford splint, or the Gihon naval splint?

5. Please state your views on some liquid ointment dressing which would be available for first aid in large wounds and burns with the object of preventing the usual dry-gauze dressing adhering to the wound and rendering subsequent dressings painless.

These questions have been sent to all the members of the Association of Railroad Chief Surgeons of America, and a few other Civil and Military Surgeons.

Please give these questions your personal attention, first, and mail your answers to the Secretary, at the same time writing him and giving him the number of copies of these question sheets desired to mail to your Associate Surgeons.

Very sincerely yours,
JOSEPH C. BLOODGOOD, Secretary,
904 N. Charles St., Baltimore, Md.

RESOLUTION ADOPTED BY THE AMERICAN FIRST AID CONFERENCE.

Washington, D. C., August 24, 1915.

Your Resolution Committee has the honor to report that it has carefully considered the resolution which was committed to it and has redrafted it as follows:

Whereas, There is a great lack of uniformity in first aid methods; in first aid packages, and in other first aid equipment; and in first aid instruction, and

Whereas, Many of the aims of first aid are defeated thereby and needless suffering and expense incurred, Therefore, be it

Resolved, That this Conference recommends to the President of the United States that he appoint a "Board on First Aid Standardization," said Board to consist of one officer each from the Medical Corps of the U. S. Army, the Medical Corps of the U. S. Navy, the U. S. Public Health Service, the American National Red Cross, the American Medical Association, the American Surgical Association and the Association of Railway Chief Surgeons of America; this Board to deliberate carefully on first aid methods, packages, equipment and instruction and to recommend a standard for each to a subsequent session of

this Conference to be called by the Permanent Chairman; the creation and maintenance of the said Board to be without expense to the United States.

Your Committee further reports that it has personally consulted the Assistant Solicitor of the Treasury and he has given the opinion that there is no legal objection to the resolution or its purpose.

The Committee has also personally consulted the Secretary to the President and he has assured your Committee that it is his personal opinion that the President will take favorable action in the premises.

Committee on Resolutions:
W. C. Rucker, Asst. Surg. Gen. U. S. P. H. S.
Major Robert U. Patterson, M. C. U. S. A.
Representing the Amer. Nat'l Red Cross.
W. L. Estes, Chairman Comm. on Fractures,
Amer. Surg. Ass.

DISGRACEFUL TREATMENT OF CHICAGO DOCTOR BY POLICE.

Dr. J. V. Fowler, addressing the Council of the Chicago Medical Society:

You may have read in the newspapers a few days ago of a doctor having been arrested for violation of the Drug Act. I would like to state what I know about the case. The doctor was visited first of all by a patient who was a drug fiend, and who was suffering from the effects of the withdrawal of the drug. The doctor was urged to take the case. At first he refused and tried to get the man to go to some institution. The man made excuses that he couldn't go at the present time, and wouldn't go to the County Hospital, but stated if he could only get on his feet for a while he could earn enough money to take the treatment. The doctor gave him some morphine, which he recorded. The man came the second time and this time the doctor cut down the amount of the drug so that he had a smaller amount to last a greater length of time. Later on, possibly a week, a lady appeared representing herself as the patient's wife and stated that he was very much better and had almost dispensed with the use of the drug. She described the man, told his address, etc., and so the doctor gave her a small bottle of a weak solution of codein, but told her not to let her husband know it was a weaker solution, and told her not to come again, as he would not give her any more, stating that her husband must come. She came again about a week afterwards, stating that her husband could not come, and he gave her still another weaker solution. In a few minutes in appeared a couple of detectives and locked him up. His wife telephoned me. I found he was booked for 9:00 o'clock the next morning. I immediately got busy and did everything I could to get him out of jail, but all to no purpose. When the case came up he was discharged. A reputable man was thrown into prison without any charge for any crime; no friends could see him or learn anything about it except that he was locked up. He was held in jail over night; and the papers published it broadcast. His reputation is affected to such an extent that possibly he will never live it down, and all for what? Nothing. It is time we are putting our shoulder to the wheel and stopping such persecutions. We are in sympathy with the purport of the law and we are all anxious to catch the violators of the law, but to throw a man into prison on suspicion alone is not a thing that should be allowed to exist. I hope this council will take action on the matter when it comes up for action.

Dr. J. C. Krafft read the following resolution:

Whereas, Chicago Medical Society is composed of doctors of approved reputation and medical standing in the city of Chicago; and

Whereas, This organization is in full accord and sympathy with the so-called Harrison Drug Act and in the enforcement of the same; and

Whereas, One of the members of this organization, a physician of the highest professional attainment and of unsullied personal and professional reputation, was arrested at 7:00 o'clock one evening for an alleged violation of said law and was taken from his home and locked up in a cell in a police station in the city of Chicago, without being charged with any offense or booked for the violation of any law and was not given any opportunity to furnish bail until the following day, and was compelled to remain all night in prison without being given the privilege of communicating with his friends, and his whereabouts being unknown to his family; and

Whereas, At the hearing before the United States Commissioner, upon a statement of the facts concerning which he was arrested, he was exonerated and discharged from any violation of law; and

Whereas, The fact of his arrest was heralded in the public press of the city of Chicago, prior to the time that he was given an opportunity of offering bail, thereby doing him an irreparable injury, both socially and professionally, and from which he had no recourse in law; and

Whereas, Such like treatment is liable to be visited upon any physician, however reputable, practicing medicine in the city of Chicago, when the instrumentalities employed, such as stool pigeons, are used for the purpose of entrapment into apparent technical violation of law, from the standpoint of his traducers, when, as a matter of fact, he may be within his legal rights as a physician under the law and be subjected to arrest and incarceration in a police station during the night, without any opportunity of giving bail, the purpose and intent of such arrest being to humiliate and degrade him in the eyes of the public, both socially and professionally, rather than the honest enforcement of the so-called Harrison Drug Act.

Whereas, This Society believe that those instrumentalities of government, whose duty it is to see to the enforcement of this law, are not in sympathy with the methods employed as hereinbefore stated if their attention were called by this organization specifically to the same and would not lend their aid in humiliating, disgracing and injuring the professional standing of any reputable physician in the city of Chicago.

Now, therefore, be it

Resolved, by the Council of the Chicago Medical Society, in council assembled, that a request be made upon the Honorable Charles F. Clyne, United States District Attorney, and also upon the Honorable Charles C. Healey, Superintendent of Police of the city of Chicago, to instruct those officers to whom the assignment is made in connection with the enforcement of the Harrison Drug Act, not to serve warrants sworn out against members of the medical profession, except between the hours of 9:00 o'clock a. m. and 4:00 o'clock p. m., when courts are in session, so as to give an opportunity for the furnishing of bail, thus removing the menace that any reputable physician shall be subjected to, the degradation and disgrace of passing a night locked up in a cell with thieves and felons; Be it further

Resolved, That a copy of this resolution be transmitted to the United States District Attorney and to the Superintendent of Police of the city of Chicago and be given publicity in the medical journals of this association; and, Be it further

Resolved, That the members of this association cooperate with and use their best endeavors in assisting the government officers in the enforcement of the Harrison Drug Law against anyone of the profession who knowingly and wilfully violates the same.

The resolution was discussed further by Drs. Earle, Brown, Hoag and Hemenway, and on vote, unanimously adopted.

TUBERCULOSIS NOTES.

The symptoms in tuberculosis can be classified into three groups, each group depending upon a certain cause.—(Pottinger.)

Group 1—Due to the tubercle toxin:
- Malaise.
- Feeling of being run down.
- Lack of endurance.
- Nervous instability
- Indigestion.
- Loss of weight.
- Increased pulse rate.
- Night sweats.
- Temperature.
- Anaemia.

Group 2—Due to reflex action:
- Hoarseness.
- Tickling in larynx.
- Cough.
- Loss of weight.
- Increased pulse rate.
- Chest and shoulder pains.
- Flushing of face.
- Apparent anaemia.

Group 3—Due to tuberculosis involvement per se:
- Frequent and protracted cough.
- Spitting of blood.
- Pleurisy.
- Sputum.
- Temperature.

It would be interesting to know how many people believe tuberculosis curable, after all the extensive publicity given this fact.

If the diaphragmic excursion of right side equals that of left side or is less, it denotes some lesion in right side of chest, as a general rule.

The diaphragm movements should be carefully studied. A change in movement denotes trouble in chest, not necessarily tuberculosis.

The best place to look for incipient tuberculosis is in the posterior supra-clavicular areas. Lesions below the clavicular areas. Lesions below the clavicle have passed the incipient period.

Making a diagnosis purely by the use of the skin test is to be deplored.

Hypodermic injections of pituitrin have acted very well in stopping pulmonary hemorrhage.

Page (Journal Iowa State Medical Society, Vol. V. No. 10) gives following conclusions on pregnancy and tuberculosis:

1. Pregnancy, birth and childbed exert a distinctly deleterious effect on actively tuberculous women.
2. This bad influence is best controverted by early termination of the pregnancy and giving subsequent anti-tuberculous treatment.
3. Interference of pregnancy after the fifth month in the absence of special indication, is of little value.
4. The tuberculous mother should not nurse her child.

The November number of the "Madison County Doctor," edited by Dr. E. W. Fiegenbaum, is devoted to the discussion of tuberculosis, or rather to the prevention of tuberculosis. It is so written and illustrated with photographs that no layman who reads it should fail to see the argument.

We wish this little journal might find its way into every home in Illinois. It would do more good in the way of educating the people to the dangers of tuberculosis infection than could be estimated.

Correspondence

MEDICO-LEGAL.

Chicago, Ill., Oct. 11, 1915.

To the EDITOR: I beg to call the attention of the profession to an act of the legislature of Illinois, which might escape notice as it is an amendment of the Pharmacy Act of Illinois. The act is senate bill No. 300 and is now in force in this state. It follows in general the Federal Anti-Narcotic Act. The records required by the Federal Act being adopted as a compliance with the

state act—among other provisions prohibit any licensed physician from furnishing or prescribing the narcotics in question for the use of any habitual user except only when prescription is for patient being treated for the drug habit. Such prescriptions when given must be in good faith and not for the purpose of evading the act. Fines for violation of the act are severe.

Attention is also called to the amendment of the act relating to the practice of medicine, which is amended to give power to the state board of health to revoke certificate to practice medicine after hearing, even in case of certificate issued under former acts respecting the license of physicians.

Another new act of the legislature is the act to regulate practice of optometry. Licensed physicians are exempted from the operation of the act which vests power respecting examinations, admissions to practice, etc., in state board of optometry.

Yours respectfully,

ROBERT J. FOLONIE.

OPTOMETRY LEGISLATIVE VOTE IN ILLINOIS

For the past few years there has been an ever-increasing feeling that we are suffering from over-legislation and are the victims of the vicious tendency on the part of present day legislators to correct everything by statute, even where it can affect but a small group of persons and regardless of the effect upon the rest of the community. This principle has become notorious in Illinois.

Private individuals or groups of individuals cannot maintain an expensive "press and publicity" staff of lobbyists while the laws are being made; the only ones who can benefit by this system are the powerful corporations, cults and sects who receive and set aside each year thousands of dollars for this purpose. In the past the doctors have been satisfied to trust themselves to the common sense of the representatives in the state Capitol. However, we have arrived at a point where we can see that this method is no longer to be relied upon.

The latter feaure was well illustrated at the last session of the Illinois legislature, when quite a percentage of the members of that body, in voting for the notorious optometry bill, violated their written or verbal pledge made to their respective county medical societies. The pledge being to the effect that if elected they would vote to maintain one standard for admission to the practice of medicine. In addition to violating the pledge mentioned, these same legislators, legalized to practice medicine, a class of practitioners totally unfitted to undertake the work, and for this the people will have to pay the penalty, even to the dimness of their vision, as well as in actual loss of life.

The violation of pledges on the part of legislators was not the only remarkable feature; there should be noted the persistence with which the supporters of the bill worked. Note, too, that much of the noise and agitation throughout the legislative session in behalf of the bill was made by persons residing outside the state of Illinois, not voters of this great commonwealth.

There are 12,000 legalized practitioners in Illinois and in contrast to this there are only a few hundred optometrists. It is difficult to imagine a legislator violating an anti-election pledge made to his physician constituents without some extraordinary influence being brought to bear. In the absence of some specific inducement, surely it could not be construed as a wise political move.

The optometrists had been before several previous legislatures and expended money without stint. We are informed (we do not know how truthfully) that a hundred and twenty thousand dollars ($120,000.00) was spent in the last legislature in obtaining the passage of this bill. Its supporters, in great numbers, were in Springfield lobbying during the entire legislative session. Members of the committee before whom the bill was pending, as well as members of delegations appearing in Springfield to oppose the bill were watched constantly. Indeed the spy system used by the proponents of this measure would do credit to any of the warring nations of Europe.

So confident of its ultimate success were its sponsors that long before its passage in the House they were bold enough to try and devise a means of completely emasculating the entire medical practice act. This, they hoped to accomplish, by writing into the optometry bill a few words so cunningly constructed that the real meaning would escape detection. Imagine the lives of the people of Illinois being jeopardized by turning loose to prey upon the people every form of quackery imaginable, which this attempted legislation would have brought about. The scheme failed, we are reliably informed, because of lack of a brain ingenious enough to contrive the necessary wording.

Legislation, which requires for its passage the maintenance of a large lobby, and an elaborate spy system, together with the expenditure of enormous sums of money, is vicious on its face and should be defeated.

Note the hypocrisy and inconsistency on the part of one member of the legislature and it will illustrate the depths to which members went in violating their ante-election pledges. The preceding general assembly created a committee on "Efficiency and Economy," of which Senator Manny (30th District) was chairman. Its function was to devise ways and means to bring about a concentration of administrative boards and to prevent the creation of new boards. The chairman of this committee was active at all board

meetings and signed a recommendation placing all departments of state government under twelve major heads. In conformity with the recommendations of this committee on "Efficiency and Economy," there was introduced into the last session of the legislature a number of bills purporting to bring about the results mentioned. They were known as "Efficiency and Economy" bills.

In this scheme all health matters were to be in the Department of Health. To bring about that ideal condition, Senate Bill No. 240 (one of the "Efficiency and Economy" bills) was introduced into the legislature. Note that on roll call on the optometry bill, Senator Manny, chairman of the committee on efficiency and economy, voted aye. A more brazen piece of inconsistency and hypocrisy would be hard to find. "Consistency, thou art a jewel."

Not content with hynotizing members of the House and Senate, this optometrists' lobby brought its peculiar influence to bear on lay employees about the state Capitol. Laymen about the executive offices in the state service who could not tell the difference between an optometrist and a buffalo were propounding the virtues of this bill (of which they knew nothing) too; for some unexplained reason the lay friends of the governor were molded into the booster campaign in its behalf.

Follow this influence a step further. The bill came before the governor for approval or veto. Optometrists, two hundred strong, headed by the national organization, in the person of a high salaried man (from New York), appeared before his honor to tell of the virtues of optometry. In the first place, the governor, in considering bills for approval or veto, should not have permitted nonresidents to appear either for or against any measure affecting the interests of the people of Illinois. Is not the body politic of Illinois able to manage its own affairs? The pernicious meddling of the optical trust, this outside hired help of the National Association of Optometrists, should have been resented by the governor, as well as the legislature, and should not have been tolerated for one moment.

At the hearing, above mentioned, there appeared against the bill a delegation of eighteen physicians representing the Illinois State Medical and the Chicago Medical Societies. The reason for this small representation is that these great organizations continue, as in the past, to trust themselves to the common sense of the representatives of the state government.

After the pros and cons of the bill were presented his Honor remarked privately to a member of the committee, "You fellows have to do something to overcome this demonstration," and a few minutes later to a member of the same committee he remarked, "Leaving aside the merits of this bill, for political reasons I have to sign it." Using the term "political reasons," in its broadest interpretation, can one imagine by any line of common sense reasoning what would prompt a man to sign such a measure to satisfy at most a few hundred non-residents of Illinois as against the wishes of 12,000 legitimate medical licensees?

Every person in Illinois is, from time to time, attended professionally by a licensed physician. The 12,000 licensed physicians, if aroused to a spirit of resentment, can influence or control each, in votes, from fifty to two hundred and fifty. This being true, imagine if you can, a more asinine statement then that it is good politics to sign, for political reasons, such a notorious bill.

Let us hope that the physicians of this state will, at the opportune time, show a proper resentment to this expression of the low esteem in which the profession of Illinois is held by our legislative and executive departments.

The *Lancet Clinic*, in a recent issue, says: "We should have at least as many physicians as lawyers in Congress." Whether this is the right percentage or not is immaterial, but it is a fact that medicine should be better represented, numerically, in our legislative halls.

The county medical societies in their respective senatorial districts should see that at least one physician is nominated for both the House and Senate at the next primary, and having succeeded in nominating at the primary, the medical profession in the respective districts, regardless of party politics, should put its shoulder to the wheel and guarantee his election. In this way only can the profession be placed in the light it is justly entitled to as a civic factor.

Doctors should take more interest in government. Instead of depending upon someone else to look after his welfare, the physician should appear personally before legislative and executive branches of government.

When you allow professional politicians to make your laws, when you are too busy to go to the primaries, you ought not to complain if the right officials are not nominated and the right laws are not enacted.

It is through the efforts of physicians themselves that requirements for medical licenses have been raised and despite the fact that it is exceedingly hard to practice medicine, but exceedingly easy to practice unhindered most any "ism," none the less whenever laws are passed regulating the licenses of physicians they are considered of peculiar benefit to the physicians rather than to the public.

The public should clearly understand that laws restricting the practice of those having certain qualifications are laws for the benefit of the public.

The fundamentality of every "ism" for which legislation is being sought are a part of the teaching of all first class medical schools and they require no separate board of examiners or a separate Board of Health to regulate their application.

Below appear the names of senators and representatives in the 49th General Assembly of Illi-

nois, together with their addresses and the boundaries of their respective senatorial districts, as well as an indication of the way they voted on House Bill No. 9, same being the notorious optometry bill.

F after the legislator's office designation (that is senator, representative, etc.,) denotes voting for the notorious optometry bill; an A in a corresponding position denotes that the legislator voted against the bill. When the space designated is blank, it denotes that the legislator was absent or did not vote on roll call.

FIRST DISTRICT

The First and Second Wards in the City of Chicago.
Geo. F. Harding, Jr., Sen.; Cook county; 2536 Indiana Ave.
John Griffin, Rep. (F); Cook county; 2020 Indiana Ave.
Wm. M. Brinkman, Rep. (F); Cook county; 3119 Indiana Ave.
Sheadrick B. Turner, Rep. (F); Cook county; 21 East Twenty-eighth St.

SECOND DISTRICT

The Twentieth Ward and Parts of the Eleventh and Twelfth Wards in the City of Chicago.
Francis A. Hurley, Sen. (F); Cook county; 1015 Cypress St.
Geo. U. Lipshulch, Rep. (A); Cook county; 920 South Ashland Boul.
Frank Ryan, Rep. (F); Cook county; 2139 West Thirteenth St.
John J. Gardner, Rep. (F); Cook county; 1523 West 13th St.

THIRD DISTRICT

The Third Ward and parts of the Fourth, Fifth and Sixth Wards in the City of Chicago.
Samuel A. Ettelson, Sen., Cook county; 3315 Calumet.
John P. Walsh, Rep. (F); Cook county; 701 West Thirty-first.
Edw. M. Santry, Rep. (F); Cook county; 116 East Thirty-sixth Place.
Robt. R. Jackson, Rep. (F); Cook county; 435 East Thirty-seventh.

FOURTH DISTRICT

The Twenty-ninth and Thirtieth Wards and part of the Thirty-first Ward in the City of Chicago.
Al. F. Gorman, Sen. (F); Cook county; 5436 Morgan St.
Geo. C. Hilton, Rep. (F); Cook county; 5440 Winchester.
Hubert Kilens, Rep. (F); Cook county; 5026 South Ashland.
Thos. A. Boyer, Rep. (F); Cook county; 4458 Emerald Ave.

FIFTH DISTRICT

Parts of the Sixth and Seventh Wards in the City of Chicago.

Morton D. Hull, Sen. (A); Cook county; 4855 Woodlawn Ave.
Michael L. Igoe, Rep. (F); Cook county; 5429 Greenwood.
Isaac S. Rothschild, Rep. (A); Cook county; 4715 Michigan.
John H. Helwig, Rep. (F); Cook county; 6931 Vernon Ave.

SIXTH DISTRICT

The Twenty-fourth and Twenty-sixth Wards and parts of the Twenty-third and Twenty-fifth Wards in the City of Chicago, and parts of the Towns of Evanston, Niles and New Trier, all in Cook County.
Geo. W. Harris, Sen. (F); Cook county; 1963 Montrose Ave.
Joseph A. Weber, Rep. (F); Cook county; 3134 North Robey St.
Robert E. Wilson, Rep. (F); Cook county; 4025 Greenview Ave.
Wm. M. Brown, Rep. (F); Cook county; 2161 Eastwood Ave.

SEVENTH DISTRICT

The Towns of Thornton, Bloom, Rich, Bremen, Orland, Lemont, Palos, Worth, Lyons, Stickney, Proviso, Leyden, Elk Grove, Schaumberg, Hanover, Barrington, Palatine, Wheeling, Northfield, and parts of the Towns of New Trier, Niles, Norwood Park and Maine, all in the County of Cook.
Frederick B. Roos, Sen. (F); Cook county; 512 Marengo Ave., Forest Park.
J. J. O'Rourke, Rep., Cook county; 15534 Vine Ave., Harvey.
Louis J. Pierson, Rep., Cook county; 730 Lake Ave., Wilmette.
Frederic R. De Young, Rep., Cook county; 50 155th St., Harvey.

EIGHTH DISTRICT

The Counties of Boone, Lake and McHenry.
Albert J. Olson, Sen., McHenry county; Woodstock.
Thomas E. Graham, Rep. (F); Lake county; Ingleside.
Edward D. Shurtleff, Rep. (F); McHenry county; Marengo.
James H. Vickers, Rep. (A); McHenry county; Harvard.

NINTH DISTRICT

Parts of the Fourth, Fifth and Twelfth Wards in City of Chicago.

Patrick J. Carroll, Sen. (F); Cook county; 3533 S. Hermitage Ave.
Robert J. Mulcahy, Rep. (F); Cook county; 3243 Archer Ave.
Joseph Placek, Rep. (F); Cook county; 2333 South Kedzie Ave.
David E. Shanahan, Rep., Cook county; 115 South Dearborn St.

TENTH DISTRICT

The Counties of Ogle and Winnebago.

Henry Andrus, Sen. (F); Winnebago county; Rockford.
H. S. Hicks, Rep., Winnebago county; Rockford, R. F. D. 3.
John A. Atwood, Rep. (F), Ogle county; Stillman Valley.
Emil A. Festerling, Rep. (A); Winnebago county; Rockford.

ELEVENTH DISTRICT

The Thirty-second Ward and part of the Thirty-first Ward in the City of Chicago.
Percival G. Baldwin, Sen. (F); Cook county; 2017 West Seventieth St.
Frank J. Ryan, Rep. (F); Cook county; 6828 Bishop St.
Henry F. Schuberth, Rep., Cook county; 7843 Lowe Ave.
John H. Lyle, Rep. (A); Cook county; 6305 Yale Ave.

TWELFTH DISTRICT

The Counties of Carroll, Joe Daviess and Shephenson.
Dr. Michael H. Cleary, Sen. (A); Jo Daviess county; Galena.

Chas. F. Franz, Rep., Stephenson county, Freeport.
R. R. Thompson, Rep., Stephenson county, Kent.
John D. Turnbaugh, Rep. (F); Carroll county; Mt. Carroll.

THIRTEENTH DISTRICT

The Eighth and Thirty-third Wards and part of the Seventh Ward in the City of Chicago, and part of the Town of Calumet, all in the County of Cook.
John A. Swanson, Sen. (F); Cook county; 6842 Harper Ave.
James W. Ryan, Rep (F); Cook county; 9034 Burley Ave.
Gotthard A. Dahlbert, Rep., Cook county; 24 West 113th St.
C. A. Young, Rep., Cook county; 2809 East 76th St.

FOURTEENTH DISTRICT

The counties of Kane and Kendall.

Thomas B. Stewart, Sen. (A); Kane county; Aurora.
Frank R. Dalton, Rep., Kane county; Aurora.
DeGoy B. Ellis, Rep. (F); Kane county; Elgin.
Harold C. Kessinger, Rep. (F); Kane county; Aurora.

FIFTEENTH DISTRICT

Parts of Ninth, Tenth and Eleventh Wards in City of Chicago.

John J. Boehm, Sen. (F); Cook county; 1901 South Halsted.
Jos. O. Hruby, Rep., Cook county; 1806 South Racine Ave.
Peter F. Smith, Rep. (F); Cook county; 1608 South Union Ave.
Thomas Curran, Rep. (F); Cook county; 2023 South Racine Ave.

SIXTEENTH DISTRICT

The Counties of Livingston, Marshall, Putnam and Woodford.

Christian Hasse, Sen. (F); Woodford county; Washburn.
Michael Fahy, Rep. (F); Marshall county; Toluca.
Simon E. Lantz, Rep. (F); Woodford county; Congerville.
Wm. H. Bentley, Rep. (F); Livingston county; Pontiac.

SEVENTEENTH DISTRICT

The Nineteenth Ward and parts of the Ninth and Tenth Wards in the City of Chicago.
Edward J. Glackin, Sen. (F); Cook county; 745 Lytle St.
John S. Burns, Rep. (A); Cook county; 622 Blue Island.
Jacob W. Epstein, Rep. (F); Cook county; 1133 Newberry Ave.
Edward J. Smejkal, Rep., Cook county; 560 Bunker St.

EIGHTEENTH DISTRICT

The County of Peoria.

John Dailey, Sen. (F); Peoria county; Peoria.
Thomas N. Gorman, Rep. (F); Peoria county; Peoria.
Robert Scholes, Rep. (F); Peoria county; Peoria.
John F. Lynch, Rep. (A); Peoria county; Chillicothe.

NINETEENTH DISTRICT

The Thirteenth and Thirty-fourth Wards and part of the Twelfth Ward in the City of Chicago, the Town of Riverside and part of the Town of Cicero, all in the County of Cook.

John T. Denvir, Sen. (F); Cook county; 1847 South Crawford Ave.
James T. Prendergast, Rep. (F); Cook county; 1233 South Lawndale Ave.
Jas. C. McGloon, Rep. (F); Cook county; 1544 South Trumbull Ave.
Solomon P. Roderick, Rep. (F); Cook county; 1328 South Spaulding ave.

TWENTIETH DISTRICT

The Counties of Grundy, Iroquois and Kankakee.
Edw. C. Curtis, Sen., Kankakee county, Grant Park.
Daniel O'Connell, Rep., Grundy county, Kinsman.
Richard R. Meents, Rep., Iroquois county, Ashkum.
Israel Dudgeon, Rep. (F); Grundy county; Morris.

TWENTY-FIRST DISTRICT

The Fourteenth Ward and parts of Seventeenth and Thirty-fifth Wards in the City of Chicago.
Edward J. Hughes, Sen., Cook county; 260 North California Ave.
Benj. M. Mitchell, Rep. (A); Cook county; 3246 Washington Blvd.
Frederick J. Bippus, Rep., Cook county; 4733 West Chicago Ave.
Thos. P. Devereux, Rep. (F); Cook county; 1357 West Ohio St.

TWENTY-SECOND DISTRICT

The Counties of Edgar and Vermilion.
Martin B. Bailey, Sen., Vermilion county, Danville.
G. A. Ray, Rep. (F); Vermilion county; Rossville.
Wm. T. Holaday, Rep., Vermilion county; Georgetown.
Abraham L. Stanfield, Rep. (F); Edgar county; Paris.

TWENTY-THIRD DISTRICT

The Fifteenth Ward and parts of the Sixteenth and Thirty-fifth Wards in the City of Chicago, and parts of the Town of Cicero, all in the County of Cook.
Seat contested.
Geo. R. Bruce, Rep. (F); Cook county; 1419 North Ridgeway.
William G. Thon, Rep., Cook county; 2210 Cortez St.
Christian M. Madsen, Rep. (F); Cook county; 3220 Cortez St.

TWENTY-FOURTH DISTRICT

The Counties of Champaign, Moultrie and Piatt.
Raymond D. Meeker, Sen. (F); Moultrie county; Sullivan.
Francis E. Williamson, Rep. (A); Champaign county; Urbana.
Wm. F. Burres, Rep. (A); Champaign county; Urbana.
Chas. A. Gregory, Rep. (F); Moultrie county; Lovington.

TWENTY-FIFTH DISTRICT

The Twenty-seventh and Twenty-eighth Wards in the City of Chicago.

Daniel Herlihy, Sen. (F); Cook county; 2743 North Albany Ave.
John G. Jacobson, Rep. (F); Cook county; 1625 North Claremont.
Chas. L. Fieldstack, Rep. (F); Cook county; 4016 North Harding Ave.
Joseph M. Mason, Rep. (F); Cook county; 3037 North Spaulding.

TWENTY-SIXTH DISTRICT

The Counties of Ford and McLean.

Noah Elmo Franklin, Sen. (A); McLean county; Lexington.

Daniel D. Donahue, Rep. (F); McLean county; Bloomington.
Wm. Rowe, Rep. (F); McLean county; Saybrook.
James C. Harvey, Rep. (A); McLean county; Bloomington.

TWENTY-SEVENTH DISTRICT

The Eighteenth Ward and parts of the Sixteenth and Seventeenth Wards in the City of Chicago.
John Broderick, Sen. (F); Cook county; 122 South Aberdeen St.
Joseph A. G. Trandel, Rep. (F); Cook county, 1332 Julian St.
Jas. N. Donlan, Rep. (F); Cook county; 964 West Madison St.
Albert Rostenkowski, Rep. (F); Cook county; 1237 Noble St.

TWENTY-EIGHTH DISTRICT

The Counties of DeWitt, Logan and Macon.
Willis R. Shaw, Sen., Macon county, Decatur.
Clifford Quisenberry, Rep., Logan county, Lincoln.
Edward C. Perkins, Rep. (F); Logan county; Lincoln.
R. C. Buxton, Rep., Macon county, Decatur.

TWENTY-NINTH DISTRICT

Parts of the Twenty-first and Twenty-second Wards in City of Chicago.

Patrick J. Sullivan, Sen. (F); Cook county; 301 West Chicago Ave.
James H. Farrell, Rep. (F); Cook county; 1147 Wells St.
Bernard J. Conlon, Rep. (F); Cook county; 444 Pine St.
Medill McCormick, Rep., Cook county; 909 Lake Shore Drive.

THIRTIETH DISTRICT

The Counties of Brown, Cass, Mason, Menard, Schuyler and Tazewell.

Walter I. Manny, Sen. (F); Brown county; Mt. Sterling.
A. M. Foster, Rep., Schuyler county, Rushville.
Wm. H. Groves, Rep., Menard county, Petersburg.
Homer J. Tice, Rep. (A); Menard county; Greenview.

For further information concerning Senator Manny's action, see reading matter at top of this article.

THIRTY-FIRST DISTRICT

Parts of Twenty-first, Twenty-second, Twenty-third and Twenty-fifth Wards in the City of Chicago.
Willett H. Cornwell, Sen. (F); Cook county; 3825 Alta Vista Terrace.
Frank J. Seif, Jr., Rep. (F); Cook county; 1529 Orchard St.
Harry F. Hamlin, Rep. (F); Cook county; 5730 Malden St.
E. I. Frankenhauser, Rep., Cook county; 5517 Winthrop Ave.

THIRTY-SECOND DISTRICT

The Counties of Hancock, McDonough and Warren.
Wm. A. Compton, Sen. (F); McDonough county; Macomb.
John Huston, Rep., McDonough county; Blandinsville.
Robert A. Elliott, Rep. (F); Warren county; Monmouth.
James M. Pace, Rep., McDonough county; Macomb.

THIRTY-THIRD DISTRICT

The Counties of Henderson, Mercer and Rock Island.

Frank A. Landee, Sen., Rock Island county; Moline.
Wm. C. Maucker, Rep., Rock Island county, Rock Island.
Thomas Campbell, Rep. (F); Rock Island county; Rock Island.
Wm. J. Graham, Rep.; Mercer county; Aledo.

THIRTY-FOURTH DISTRICT

The Counties of Clark, Coles and Douglas.

John R. Hamilton, Sen., Coles county; Mattoon.
C. A. Purdunn, Rep., Clark county; Marshall.
Harry W. Drake, Rep. (A); Clark county; Marshall.
E. Walter Green, Rep. (A); Douglas county; Hinsboro.

THIRTY-FIFTH DISTRICT

The Counties of DeKalb, Lee and Whiteside.
Adam C. Cliffe, Sen. (A); DeKalb county; Sycamore.
John P. Devine, Rep. (A); Lee county; Dixon.
William L. Leech, Rep., Lee county, Amboy.
F. A. Brewer, Rep. (F); Whiteside county; Tampico.

THIRTY-SIXTH DISTRICT

The Counties of Adams, Calhoun, Pike and Scott.
Charles R. McNay, Sen. (to fill vacancy) (A); Adams county; Ursa.
Wm. H. Hoffman, Rep., Adams county, Quincy.
Edwin Thomas Sturbinger, Rep. (A); Pike county; El Dara.
Geo. H. Wilson, Rep., Adams county; Quincy.

THIRTY-SEVENTH DISTRICT

The Counties of Bureau, Henry and Stark.

Clayton C. Pervier, Sen. (F); Bureau county; Sheffield.
Frank W. Morrassy, Rep. (F); Bureau county; Sheffield.
Randolph Boyd, Rep., Henry county; Galva.
John R. Moore, Rep. (F); Henry county; Kewanee.

THIRTY-EIGHTH DISTRICT

The Counties of Greene, Jersey, Macoupin and Montgomery.

Stephen D. Canaday, Sen. (F); Montgomery county; Hillsboro.
Wm. Hubbard, Rep. (F); Greene county; Carrollton.
H. A. Shepard, Rep. (F); Jersey county; Jerseyville
Otto C. Sonnemann, Rep. (F); Macoupin county; Carlinville.

THIRTY-NINTH DISTRICT

The County of La Salle.

Peter E. Coleman, Sen. (F); LaSalle county; LaSalle.
Lee O'Neil Browne, Rep., LaSalle county; Ottawa.
Ole E. Benson, Rep. (F); LaSalle county; Ottawa.
Wm. M. Scanlan, Rep. (F); La Salle county; Peru.

FORTIETH DISTRICT

Counties of Christian, Cumberland, Fayette and Shelby.

E. Jeff Tossey, Sen. (A); Cumberland county; Toledo.
Arthur Roe, Rep., Fayette county; Vandalia.
John C. Richardson, Rep., Christian county; Edinburg.
Walter M. Provine, Rep., Christian county; Taylorville.

FORTY-FIRST DISTRICT

The Counties of Du Page and Will.

Richard J. Barr, Sen., Will county; Joliet.
Michael J. Hennebry, Rep., Will county; Wilmington.
Wm. R. McCabe, Rep. (F); Will county; Lockport.
Squire F. Tompkins, Rep., Will county; Joliet.

FORTY-SECOND DISTRICT

The Counties of Clay, Clinton, Effingham and Marion.

Dr. F. C. Campbell, Sen. (A); Clay county; Xenia.
Walt. E. Rinehart, Rep. (F); Effingham county; Effingham.
John W. Thomason, Rep., Clay county; Louisville.
Chas. W. Vursell, Rep. (A); Marion county; Salem.

FORTY-THIRD DISTRICT

The Counties of Fulton and Knox.

W. C. Jewell, Sen., Fulton county; Lewistown.
Wm. H. Basel, Rep., Fulton county; Astoria.
Owen B. West, Rep. (F); Knox county; Yates City
James E. Davis, Rep. (F); Knox county; Galesburg.

FORTY-FOURTH DISTRICT

The Counties of Jackson, Monroe, Perry, Randolph and Washington.

Kent E. Keller, Sen. (A); Jackson county; Ava.
W. T. Morris, Rep., Perry county; Duquoin.
Harry Wilson, Rep., Perry county; Pinckneyville.
Hawkins O. Murphy, Rep. (F); Perry county; Pinckneyville.

FORTY-FIFTH DISTRICT

The Counties of Morgan and Sangamon.

Elbert S. Smith, Sen. (F); Sangamon county; Springfield.
Edward L. Merritt, Rep., Sangamon county; Springfield.
Wm. J. Butler, Rep., Sangamon county, Springfield.
Thomas E. Lyon, Rep., Sangamon county, Springfield.

FORTY-SIXTH DISTRICT

The Counties of Jasper, Jefferson, Richland and Wayne.

W. Duff Piercy, Sen. (A); Jefferson county; Mount Vernon.
John Kasserman, Rep. (A); Jasper county; Newton.
John L. Cooper, Rep. (A); Wayne county; Fairfield.
Chas. L. Wood, Rep. (A); Wayne county; Keenes.

FORTY-SEVENTH DISTRICT

The Counties of Bond and Madison.

J. G. Bardill, Sen. (F); Madison county; Highland.
Ferd A. Garesche, Rep., Madison county; Madison.
Norman G. Flagg, Rep. (F); Madison county; Moro.
Chris Rethmeier, Rep. (F); Madison county; Edwardsville.

FORTY-EIGHTH DISTRICT

The Counties of Crawford, Edwards, Gallatin, Hardin, Lawrence, Wabash and White.

Dr. J. A. Womack, Sen. (A); Gallatin county; Equality.
Carl Green, Rep. (A); Crawford county; Robinson.
Richard F. Taylor, Rep., Hardin county; Elizabethtown.
James A. Watson, Rep. (F); Hardin county; Elizabethtown.

FORTY-NINTH DISTRICT

The County of St. Clair.

Paul W. Abt, Sen. (F); St. Clair county; East St. Louis.
John T. Desmond, Rep., St., Clair county; East St. Louis.
Stephen T. LePage, Rep. (A); St. Clair county; East St. Louis.
James W. Rentchler, Rep. (A); St. Clair county; Bellevue.

FIFTIETH DISTRICT

The Counties of Alexander, Franklin, Pulaski, Union and Williamson.

D. T. Wood, Sen. (F); Franklin county; Benton.
James H. Felts, Rep., Williamson county, Marion.
Chas. Curren, Rep. (F); Pulaski county; Mound City.
C. A. Stewart, Rep. (F); Franklin county; West Frankfort.

FIFTY-FIRST DISTRICT

The Counties of Hamilton, Johnson, Massac, Pope and Saline.

Sam. W. Latham, Sen. (absent); Saline county; Eldorado.
W. C. Kane, Rep., Saline county; Harrisburg.
Elwood Barker, Rep. (A); Hamilton county; McLeansboro.
Oral P. Tuttle, Rep. (F); Saline county; Harrisburg.

In view of all that has been said members of the medical profession residing in the respective districts outlined above should make a memorandum of the way their Senator and Representatives voted for or worked to bring about the passage of the notorious Optometry Bill (in the 49th General Assembly) and at once get busy, perfect an organization and work consistently from now until the convening of the next session of the Legislature to the end that as many as possible of these men who voted for the Optometry Bill at the last session will fail of re-election when they again go before the voters, otherwise the people will have foisted upon them at the next session Osteopathic and all the other freak medical Legislation ever heard of.

LEGISLATIVE COMMITTEE,
Illinois State Medical Society.
PUBLIC RELATIONS COMMITTEE,
Chicago Medical Society.

Fresh air is the best life assurance agency.

* * *

Get the fresh air habit; dress warm enough to enjoy it.

* * *

Colds are "catching."

* * *

Coddle yourself and you flirt with pneumonia.

* * *

Breathe freely and fully; the more you expand your chest the less you will contract colds.

—Healthgrams from Bulletin, Chicago Department of Health.

Auto Sparks and Kicks

RULES FOR CAR CLEANING.

No varnish will endure being scrubbed with a brush or with hot water, says W. J. Mead of the Chicago Chevrolet branch. No varnish will withstand the chemical action of ammonia or any kind of lye soap nor any of the common washing fluids or powders. No varnish will stand having dust or mud rubbed off nor will it endure the grist of dust and mud driven into it by the water blast from a high pressure hose to which it is often subjected.

Use water at 60 degrees or lower and a soft, clean cloth or sponge. It is best to use no kind of soap unless it is pure castile. Mud, wet or dry, should be removed with flowing water squeezed from a clean sponge or flowing from a hose with little pressure—never with a water blast.

When not in use keep the car covered with a soft-lined cover. All dust contains grit and all smoke contains acid, and against these a cloth cover offers adequate protection.

However well varnish has endured weather testing, it may be seriously affected by instant extremes of temperature. A glass dish may be filled with boiling water, slowly, without cracking it, and may be filled with ice water, slowly, but it will invariably crack if plunged instantly from boiling water into ice water, and vice versa.

FIRE-EXTINGUISHING CHEMICALS.

Carbon tetrachloride is an excellent fire extinguisher. It is a liquid which may be purchased at any drug store for 15 cents a pound. Another compound that has been used with success is two parts of common salt, one part ammonium chloride and seven parts water.

WHY BLACK?

With the time of the year when new models are settling down into regular production it is to be noticed that a few manufacturers are breaking away from the black finish that lately threatened to become universal. Of course, the reason for using black in the first place was that it was cheaper than a color and a little black enamel has a great covering power, but black is the very worst paint that could possibly have been chosen for automobile finishing.

Firstly, black shows the tiniest speck of mud or dust long before any other color and two cars starting out in the morning, one black and the other gray, will look totally different at the end of the same run. In a day's use in a town, even in good weather, a black car loses its freshly washed appearance almost at once, and by the afternoon it is dingy. On the other hand, a gray or blue, or brown, even a dark green or a maroon tint, will look fresh for days together.

Then again black is dependent absolutely upon its varnish, for without the gloss it rapidly takes on a rusty tinge like a hobo's coat, which no washing will ever remove. A colored car looks its best, of course, when the varnish is new, but when it has eventually gone dull it still lacks the seedy appearance of old black; it still looks fresh after a wash and the owner's pride in his car is generally more lasting. What's the use in washing a car that looks none the better for it?

The days of bright colors are gone perhaps; some yearn for brilliant reds and yellows, but good neutral tint browns and grays that both look well and wear well ought to be considered by manufacturers much more than they have been. —The Automobile.

TWO TYPES OF CARBURETOR.

Some carburetors have a valve by which it is possible to change the size of the hole through which the gasoline enters the mixing-chamber at the top of the spray nozzle.

A fixed-nozzle carburetor has no such adjustment and in order to change the nature of the mixture the amount of air entering the carburetor must be regulated. Cutting down on the air will increase the vacuum and cause the mixture to be richer. By allowing more air to enter the mixture will be leaner in character.—*Exch.*

WHAT TO USE ON LEATHER.

Do not use gasoline in cleaning leather upholstery. Plain water with a little ammonia will remove the dirt and a brisk rubbing with a clean woolen or flannel cloth will do the rest. For still more careful treatment use a regular leather dressing.

Society Proceedings

COOK COUNTY

CHICAGO MEDICAL SOCIETY

Regular Meeting, October 6th, 1915.

1. Results of American First Aid Conference, Joseph C. Bloodgood, Baltimore, Md.

2. Newer Methods of Caesarian Section, J. B. DeLee; Lantern Slides; Discussion, C. S. Bacon and H. M. Stowe.

3. Lantern Slide Lecture on His Work in Sex Gland Implantation, G. Frank Lydston.

Regular Meeting, October 13, 1915

1. Report on a Typhoid Epidemic in Belgium, Caroline Hedger.

2. Hernias of the Urinary Bladder, Aime Paul Heineck; Discussion, Carl Beck and A. J. Ochsner.

3. Longevity in Its Relation to Sex, or Why Fewer Men Than Women Attain Old Age, Albert H. Burr; Discussion, Gordon G. Burdick and Margaret Jones.

Regular Meeting, October 20, 1915

1. The Chronic Running Ear (20 minutes), R. H. Brown; Discussion, Norval H. Pierce and Adolph Hartung.

2. Action of Adrenalin in Gastric Crisis and Its Relation to Betaiminazolylethylamine (10 minutes), Bayard Holmes.

3. An Outline of the Medical Care of the Soldier in the Field, Lieutenant Colonel W. B. Bannister, U. S. M. C.

Joint Meeting of the Chicago Medical and Dermatological Societies, October 27, 1915

Subject for the evening, "Leprosy."

The Importance of the Subject, Joseph Zeisler.

Clinical Description, Oliver S. Ormsby.

Pathology and Bacteriology, Fred G. Harris.

Sanitary Aspects of Leprosy in the United States, William A. Pusey.

Discussion to be opened by David Lieberthal.

CHICAGO LARYNOLOGICAL AND OTOLOGICAL SOCIETY.

Regular Meeting, Held March 16, 1915, With the President, Dr. George W. Boot, in the Chair.

ANOMALOUS CONDITION OF MIDDLE EAR, WITH PULSATION OF LOWER HALF OF MEMBRANA TYMPANI AND DISTAL END OF THE FLOOR OF THE AUDITORY CANAL.

Dr. Otto J. Stein saw this patient for the first time in November, 1914—about four months ago. At that time he gave a history of having been deaf in the left ear, the right ear being normal. At no time has there been a history of any discharge or pain. The only thing noticed was that the loss of hearing began rather gradually, accompanied by tinnitus and some vertigo. When first seen, the drum was a little red, probably from manipulation incident to treatment. He had been under the care of some others prior to coming to the speaker. This redness gave the impression of an inflammation, but as that subsided one could see that the drum was very flaccid and thin, and apparently otherwise normal. There was no evidence of a scar. It lay well forward toward the floor and anterior wall of the canal, giving the impression as of something pushing it from behind outward and forward. When the otoscope was inserted firmly, and compression made, this flaccid drum was driven back to its more normal position, and as the air reentered allowing the drum to sink outward and forward, you could see the pulsation synchronous with the carotid. There was no hearing whatsoever in that ear, neither bone nor air conduction. Since being under observation he has a little bone conduction. His static apparatus is all right. He had a very faint rotary nystagmus on looking straight forward when twelve milliamperes of current were used. Otherwise negative. Responded to all tests.

Dr. Stein presented the case as a rather curious anatomical anomaly. He did not know the exact pathology. On compression of the carotid in the neck with the finger the patient said the tinnitus was markedly diminished. If pressed long and hard enough, it would disappear altogether.

The patient has remained in about the same condition as when first seen, four months ago, and at that time he had had the trouble for six months.

DISCUSSION.

Dr. Otis H. Maclay asked if the blood pressure is very high.

Dr. Stein said he did not know the blood pressure. He had some x-ray plates which are interesting, which he showed to the members.

Dr. Shambaugh asked if there was no discharge at any time. Also if there was perforation.

Dr. Stein replied that there was no discharge at any time. Also, there was no perforation, except that done traumatically. From examination of the x-ray pictures, it looked to him like a diverticulum off the sigmoid portion of the sinus, like an appendix coming off toward the floor of the canal.

UNUSUAL CASE OF VERTICAL NYSTAGMUS CAUSED BY LABYRINTHINE IRRITATION.

Dr. Alfred Lewy exhibited this case. The man is forty-two years of age; married; gives a history of discharge from the ear in childhood, which has not troubled him since he was about ten years of age, but for the last year has been complaining of mild vertigo coming on suddenly, particularly on sudden movements of the head or turning the eyes suddenly to either extreme. The patient admitted having syphilis about twenty years ago.

On examination, the speaker found a large anterior marginal perforation in the left drum membrane, and both ears gave the usual findings of a marked conduction deafness, more marked in the ear with the perforated membrane. After rotation, nystagmus is thirty seconds to either side. On account of the perforation, the speaker did not try the caloric test, and did not have any electrical apparatus handy for the electric tests. He did find, however, that on compression of air in the left canal he had a marked vertical nystagmus, two or three jerks downward, and Dr. Lewy believed this to be a very rare condition; in fact, some claim that there is no such thing as a vertical nystagmus from the labyrinth. It is very evident that this nystagmus is caused by labyrinthine irritation. The Doctor, however, was not prepared to give any explanation for it. He hoped some of the members could offer an explanation of such a condition in the presence of a perforated drum membrane.

Dr. Shambaugh asked if he could get the reverse nystagmus by suction, to which Dr. Lewy replied that the suction reaction was doubtful.

DISCUSSION.

Dr. J. R. Fletcher believed there was a fistula present in the case, but unless the eyes move in opposite directions by compression in one and suction in the other, it is not demonstrated. At least, that was the law laid down by Barany, and seemed to the speaker to be correct. You can have the reasonable probability with movement in one direction, but no proof.

The speaker has produced a nystagmus by direct pressure, which would move the stapes inward, and that might be the case in the patient presented. He remembered indistinctly a case he saw a good many years ago of vertical nystagmus, and his impression was very strong that this man had a fistula in the oval window and a vertical nystagmus was produced by pressure. There was no nystagmus by suction. It was tried then to see whether the same thing could be produced on a perfectly normal individual, and one of the doctors present volunteered for that purpose, and with strong pressure a nystagmus in one direction could be produced.

Dr. George E. Shambaugh said that he was not inclined to exclude the existence of a fistula where one is able to produce a nystagmus in one direction by pressure, but fails to get the reverse nystagmus by suction. One can easily imagine the development of pathological conditions about the opening of the fistula which would permit a motion of the endolymph being caused either by suction or pressure, but not by both. One also gets a fistula symptom in cases where no fistula exists. He has been able to develop this symptom by the inflation of the middle ear in cases where there had never been a suppurative disease. The nystagmus which occurs in fistula cases is in the plane of the canal which is involved. For this reason it is not easy to figure out how a vertical nystagmus can be caused. The horizontal and the superior canals are the two which encroach upon the middle ear spaces, and in which fistula can develop from suppurative otitis media. Possibly a fistula into the vestibule, associated with inflammatory deposits in the labyrinth, might result in producing endolymph currents by pressure which could so affect two of the canals as to produce vertical nystagmus.

Dr. Lewy, in closing the discussion, did not see why we must assume that the nystagmus is necessarily the result of a lesion in one of the canals. It is possible that he general compression of the endolymph through the pressure produced on the round window and oval window through the external canal may in some way affect the end organ in the saccule or utricle, and in that way cause a nystagmus, but as to whether a fistula was the cause of the nystagmus, the speaker could not say. His principal reason for presenting the case was that it was only recently that he read a statement in a laryngological journal that there was no such thing as vertical nystagmus resulting from a lesion of the labyrinth, and it is very evident in the case presented that this nystagmus is induced by irritation of the labyrinth.

EXHIBITION OF THREE PATIENTS OPERATED ON BY THE "STANDARD TONSILLECTOMY," TO BE DESCRIBED LATER IN DR. FLETCHER'S PAPER.

Dr. J. R. Fletcher said that he had shown these patients to quite a number of the gentlemen present. His purpose in bringing them was to show that one can get by dissection, called the "standard tonsillectomy," uniform results, which seem to the speaker to be desirable—namely, rudimentary tonsillar fossa and a minimum scar. The first case was operated on four years ago, the second case one and one-half years ago, and the third one just one week ago. The results in the two which had healed are almost identical, and he knows from former experience that the same result will obtain in the third case. As the paper would show, the speaker believes there is a reason for such uniform results.

SPECIMEN OF RIGHT FRONTAL SINUS WHICH EXTENDED DOWNWARD, SEEMING TO SEPARATE THE CRISTA, AND EXTENDING INTO THE PERPENDICULAR PLATE OF THE ETHMOID. EXHIBITION OF X-RAY PICTURE OF CASE.

Dr. L. W. Dean, Iowa City, Iowa, said this specimen had been discovered in working out a series of anomalous frontal sinuses. In this specimen the right frontal sinus extended downward, seemed to separate the crista, and extended into the perpendicular plate of the ethmoid. The x-ray showed this sinus descending into the bone of the septum.

DISCUSSION.

Dr. George E. Shambaugh stated that he had in his collection a specimen somewhat similar to the one shown by Dr. Dean. In his specimen the frontal sinus on one side had a prolongation down into the nasal bone, but no opening into the nose. There was a large defect in the septum, separating the sinuses, and the drainage was through the opposite frontal sinus. It is not easy to see how a sinus of this sort develops. The frontal sinus is an outgrowth from the middle meatus. It seems probable that the opening in the nose had become closed by pathological conditions and the artificial opening had been made through the septum into the opposite sinus.

CASES OF LATERAL SINUS THROMBOSIS.

Dr. Boot reported four cases of lateral sinus thrombosis in detail.

CASE 1. Male, aged 18. One month ago was operated on for enlarged turbinates. Used a nose wash which he snuffed up his nose. A few days later complained of pain in the right ear, which was soon followed by a discharge from that ear. The ear had been running ever since, and the pain continued until the evening before admission to the hospital. At this time he says he became feverish and felt sick. Has

had no chill, nausea or vomiting. Temperature on admission was 104.2; pulse 128; respirations 24. Blood examination showed 20,100 whites. Mastoid operation performed the same afternoon by Dr. Friedberg, at which time lateral sinus was exposed, and found to all appearances normal. Small drain inserted and wound closed. Temperature continued irregular for nine days, when Dr. Boot reopened the mastoid, in Dr. Friedberg's absence, and exposed and opened the lateral sinus. A thrombus was removed after evacuating pus. Free bleeding obtained from upper portion of sinus, but not from lower. Upper end tamponned with iodoform gauze, drain inserted and wound dressed. Temperature at times fell to normal, but did not remain so, after this operation. Had several chills. Intense pain in shoulder, arms and hips. Blood count showed 20,080 whites. Operation six days following second one, and right jugular exposed and opened, liberating about 3 drams of pus. The vein was not ligated. Small rubber drain passed upwards inside the vein as far as the temporal bone. The day following there were tenderness and swelling over left great trochanter. Twelve days after this an abscess over left great trochanter was opened, and about a pint of pus evacuated. Seventeen days following the third operation the wound in the neck was closed, and mastoid wound closing. General condition good. This case shows what a severe amount of trouble may occur in a case where there is apparently but slight infection in the mastoid. The speaker regretted that he did not ligate the jugular at the time of the sinus operation, because he feels that if this had been done, the patient might have been saved a great deal.

Case 2. Male, aged 4. Admitted to Cook County Hospital May 8, 1914, with scarlet fever. Given 1,000 units of antitoxin. On May 11th, 10,000 units of antitoxin given. At 10:30 of the same day another 5,000 units of antitoxin were given. May 12th, 15,000 units; May 13th, 10,000 units; May 19th, 10,000 more units of antitoxin given. On May 14th, ears began to discharge. The case apeared to be one of severe nasal diphtheria, but culture for diphtheria was negative. On May 30th a simple mastoid operation was done on the left side. Drain inserted. On June 10th temperature went up to 105.6°. Wound was reopened, sinus exposed, opened and thrombus removed. Free bleeding secured from each end of the sinus. Tampon of iodoform gauze. On June 12th, the little patient managed to tear off all the dressings and following this had a profuse hemorrhage from the sinus. On June 14th the patient again removed the dressings, and had considerable bleeding. Patient died on June 16th, from the toxemia from the scarlet fever, although this was doubtless assisted by the loss of blood which occurred at the time when he tore off the dressings. Also, in all probability the large amount of antitoxin contributed to the fatal result.

Case 3. Female, aged 3 years and six months. Had attack of pneumonia five weeks before present illness, which began two weeks before admission with severe pain in right ear. The drum membrane ruptured spontaneously and pain became easier. Discharged stopped after one day. Five days later a swelling appeared behind the ear. Admitted to Children's Memorial Hospital on May 27, 1914, with temperature of 105°. The right canal was wet with pus, and there was some redness and tenderness over right mastoid, May 28th: Throat culture negative for diphtheria. May 30th: Mastoid operation. Lateral sinus exposed and found eroded and thrombosed. Musopus found around sinus. Free bleeding secured from upper portion of sinus, but not from lower. Upper portion closed by a tampon of gauze and a drain inserted. On June 2nd temperature 106°. No rigidity of neck; no spasticity or rigidity of extremities. Temperature continued irregular until June 8th, when jugular vein was exposed and found filled with an organized thrombus. From this time on her temperature gradually improved until June 24th, when she was found to have diphtheria, from which she recovered completely. The condition in the sinus in this case was very similar to that in Case 1, but fortunately for the patient the thrombus in the jugular bulb and vein became organized instead of breaking down into pus, and there were no pyemic abscesses.

Case 4. Male, aged 21. Admitted to Cook County Hospital, December 7, 1914. Tenderness quite marked over mastoid and occipito-temporal region. No marked signs of local inflammation. No palpable masses of fluctuation. Right ear: External ear not swollen; tender and painful on movement. No pus from external meatus. Drum looks thickened and congested. Muscles of neck rigid, especially posterior cervical. Glandular enlargement marked. Complete seventh nerve paralysis on right side, involving upper lid and forehead. Slight chronic pharyngitis. December 12th: Operation. Outer wall of mastoid of ivory hardness, about four or five millimeters thick. Knee of sigmoid sinus projected into this cavity. When the cavity was cleaned out, two sequestra were found in its flow which must have reached almost to the labyrinth. Usual plastic was done on membranous canal and wound closed. Erysipelas developed subsequent to operation, which had pretty well cleared up by December 21st. Blood count on December 21st, 28,000 leucocytes. On December 22nd, patient had chilly sensations, and temperature of 103.6°. With the erysipelas clearing up rapidly, the chill and temperature made Dr. Boot suspect a sinus thrombosis. Accordingly, the patient was anesthetized and the bone removed still farther from over the sinus, with the intention of exploring the sinus. In removing a piece of bone with the biting forceps a small splinter penetrated the sinus and free bleeding occurred, putting an end to his suspicions of thrombosis. The sinus walls were softened and covered with granulations. The sinus was tamponned and wound packed. Erysipelas gradually cleared up, and on January 8th had normal temperature.

Dr. Boot cited this case to show the difficulties which may occur at times in the diagnosis of a sinus throm-

bosis. This patient had a streptococcus infection causing erysipelas, but the streptococcus, we know, frequently causes sinus thrombosis. There seemed to be fully as much chance that a sinus thrombosis was occurring as that an erysipelas was recurring, and, knowing the virulence of streptococcus infection about the ear, he explored the sinus without waiting; had he waited another twenty-four hours he probably would not have operated on the sinus.

In cases 1 and 3 he was not able to get free bleeding from the lower extremity of the sinus, that is, from the jugular bulb. Under similar circumstances in the future he expects to ligate the jugular vein. It seems to him the small amount of risk and danger to the patient is fully offset by the lessened risk of pyemia.

DISCUSSION.

Dr. Robert Sonnenschein said, apropos of the difficulty of recognizing the presence of sinus thrombosis, he wanted to briefly report a case in which Dr. Boot had kindly assisted him. The man was about thirty years of age, and was admitted to the County Hospital the previous week with a history of discharge from the ear for the past month. There was no history of chill or high temperature. Temperature on admission was 99°. There was some tenderness over the mastoid, and profuse, thick, purulent discharge from the ear. The next day a simple mastoid was done—the antrum found rather high, and apparently all necrotic bone removed. The patient, however, did not recover consciousness. Temperature on the day of operation was 101°, and on Saturday, the day following the operation, it went up to 103° at noon. He was reoperated and the sinus uncovered, it being necessary to go through solid, aparently healthy bone to reach the sinus. It was found filled with pus and a clot. The patient was moribund when placed on the table, and died shortly after the sinus was exposed. In this case there was absolutely no history of chill and high temperature until an hour or two before the past operation. The leucocyte count on the day of operation was 25,000.

Dr. Boot said that he had hoped the members would discuss the diagnosis and treatment of sinus thrombosis, especially with reference to the point of whether to ligate the jugular or not.

Dr. George E. Shambaugh said he thought sinus thrombosis is the most frequent serious complication that occurs in acute suppurative otitis media. The typical symptoms when the sinus is the seat of absorption are so characteristic that they can scarcely be mistaken. The high temperature, the sudden drop to subnormal, a sudden chill, and a recurrence of the same fluctuation in temperature. Not all the cases presenting these classical symptoms require the same treatment. These symptoms occur apparently from an involvement of the veins leading from the mastoid to the sinus, and where there is no actual thrombosis of the sinus itself. Dr. Shambaugh has several times operated and exposed the sinus in the presence of the characteristic fluctuations in temperature only to find no evidences of a thrombosis, with a droplet of pus apparently in contact with the sinus wall. Such cases usually recover promptly simply on removal of the condition in the mastoid.

The question of what should be done when the sinus is found to be thrombosed must be decided differently in different cases. Where there is no evidence of a softening of the thrombus, a free opening of the sinus, with perhaps a partial removal of the thrombus, is very often better than an attempt to get bleeding from both ends. In cases where there is a suppurating thrombus, an effort should be made to remove as much as possible of the infected thrombus. Before this is undertaken the internal jugular should first be ligated.

Dr. Norval H. Pierce said a practical point was raised by Dr. Boot's paper, namely, the question of waiting. There are certain operators who, given a chill and a sudden rise in temperature, accompanied by a high leucocyte count and a running ear, will immediately operate on a sinus, open the sinus, and ligate the jugular. After a long experience he has come to the conclusion that that is a mistake. He does not think we should rush suddenly into any of these cases. He does not think that the patient's life is particularly endangered by waiting, by introducing the element of very careful observation before we go into these cases. He has had several experiences such as those cited by Dr. Boot, where, in the course of an otitis media—suppurative—the patient has had a chill and high elevation of temperature, accompanied by a high leucocyte count. In the course of a few hours or the next day an erysipelas developed, and there are other things that may happen in the body that will give this same picture, such as pneumonia, malaria, etc.

But once the diagnosis is made of a sinus thrombosis, his experience has taught him that we can scarcely be too radical. He has tried the method of slitting up the sinus and allowing the thrombus to remain *in situ*, simply packing it open, but has been rather disappointed in this method. He believes an endeavor should be made to get a hemorrhage from both ends of the wound, and failing hemorrhage from the lower portion we should not only ligate the jugular, but we should dissect it out from above the facial to as near as possible to the clavicle.

He would say that a leucocyte count should be taken in all cases of mastoid trouble, where operation is performed, and if a very high leucocyte count is found, we should be very careful to explore very much more thoroughly than we would if we did not find such a high leucocyte count before operation.

Dr. Kahn asked Dr. Pierce what he thought about blood cultures, to which Dr. Pierce replied that he did not believe they amounted to very much as a pathognomonic sign of sinus thrombosis. The work of Duel and others in New York is so contradictory that he does not believe much dependence can be placed on the findings of bacteria in the blood as a sign of sinus thrombosis. In his own work, which has been very limited in that regard, because after reading the work above referred to he came to the conclusion that it was not dependable, he has found bacteria in the blood where there could not possibly have been any sinus thrombosis whatever. Therefore, he would say that the bacteriemia is not an indication of sinus thrombosis.

Dr. S. A. Friedberg fully agreed with Dr. Pierce in regard to conservatism in these cases. However, he thinks there are times when we can be too conservative. He thinks too much reliance has been placed on blood findings, waiting for the high leucocytosis. A low leucocyte count does not exclude sinus infection, by any means. Neither does a negative blood culture. His experience with blood cultures has been about fifty per cent positive. We know, too, that we may get a positive blood count from other infections—from a streptococcic sore throat, for instance. A certain work carried out at the Durand Hospital for Infectious Diseases found that in almost all the cases examined—he could not recall the exact number—cultures were made aerobically and anaerobically, and organisms were found in at least ninety per cent of the cases were quite careful culture work was done in conditions other than sinus infections. He recalled two cases seen recently of sinus thrombosis in which the infection extended to the meninges—cases in which there was no definite picture of sinus involvement, although suspicion of it was present at the time. In one of these cases there were chilly sensations—not regularly—perhaps not more than one in a week; a relatively low temperature; a leucopenia instead of leucocytosis; and a negative blood culture. The speaker wished to bring out one point in connection with suspected sinus infection: The mere fact that a sinus appears normal does not necessarily mean that there is nothing in the sinus. During the last few months he has seen two cases where a practically normal-appearing sinus contained pus.

(*To be continued*)

FULTON COUNTY

Eighteenth Annual Meeting, October 5, 1915

The eighteenth annual meeting of the Fulton

County Medical Society was held in the Auditorium of the Y. M. C. A. building in Canton, Ill., October 5, 1915, and was called to order at 1:30 p. m. by President Howard.

Dr. Simmons was appointed secretary pro tem.

Minutes of the July meeting were read and adopted.

The president appointed Drs. Chapin, Shallenberger and Snively as auditing committee.

Chairman Stoops of the committee on by-laws reported that 300 copies of the new constitution and by-laws had been printed and that their work had been completed.

On motion, the report was adopted and the committee discharged.

Secretary Ray having arrived, Secretary pro tem Simmons was relieved.

The election of officers resulted as follows: Dr. C. N. Allison was elected president; Dr. J. C. Simmons, first vice-president; Dr. D. S. Ray, secretary-treasurer; Dr. C. E. Howard, delegate to the state meeting for the term of two years; Dr. P. H. Stoops, necrologist.

Dr. Oren objected to the form of the elections and nominations as not conforming to the new by-laws.

Chapin and W. D. Nelson moved that the by-laws pertaining to the nomination of officers by ballot be suspended in the election of officers today. Carried.

Chapin and W. D. Nelson moved that the officers elected be hereby ratified. Carried.

Dr. Chapin was elected member of the board of censors for the term of three years.

Drs. Connelly and Chapin moved that the terms of the two holdover members of the Board of Censors be hereby ratified as follows: Dr. Parks for one year and Dr. Scholes for two years. Carried.

Auditing committee reported that they had found the secretary-treasurer's report correct. Report was adopted and committee discharged.

Secretary-treasurer's report was read, showing with $97.77 on hand at the beginning of the year, collections had been made totaling receipts at $305.27.

Bills to the amount of $176.37 had been paid, leaving $128.90 cash on hand.

The report was adopted.

Printing bill of the *Ipava Tribune* was read and allowed.

On motion a recess of 15 minutes was taken.

Dr. J. F. Percy of Galesburg presented a paper on "Some Results of the Application of Heat in Inoperable Carcinoma of the Uterus."

General discussion followed.

Among the many good features of the paper Dr. Percy, in the final discussion, emphasized the points that cancer cells were destroyed by a temperature of 115 F., while the normal cell would stand 140 to 145 F. without damage and that the hand in a rubber glove was the most convenient means of regulating the heat. When the electrode became too hot for the hand in the rubber glove it was too hot for normal cells; also that it was impossible to say that the disease was, or that it was not, due to an organism. At times he was inclined to think that it, was but it was impossible to prove it.

Dr. Milton Portis, Chicago, presented a very valuable paper on "The Differential Diagnosis of Lesions of the Right Upper Quadrant of the Abdomen."

"Some Disturbances of Metabolism Affecting the Ocular Tissues" was ably given by Dr. Frank Brawley of Chicago.

A telegram from Dr. Frank E. Simpson was received, stating that on account of sickness in his family he would not be able to attend the meeting.

Recess was taken until 6:00 o'clock, when all members and invited guests reconvened in the Congregational Church, where the ladies of that church served a bountiful banquet.

After a half hour of music and toasts the audience was treated to a magnificent paper, illustrated with lantern slides, on "Mechanics and Treatment of Backache, Acute and Chronic," by Dr. P. B. Magnuson, Chicago. Forty-two members and five visitors were present.

A unanimous vote of thanks was tendered Drs. Percy, Portis, Brawley and Magnuson.

Adjourned. D. S. RAY, Secretary.

JACKSON COUNTY

The third quarterly meeting of the Jackson County Medical Society met at the Elk's Home in Carbondale, Wednesday, September 22, 1915.

The minutes of the previous meeting were read and approved. Drs. W. H. Evans and W. B. Inman of Murphysboro were received into the society as members. The program consisted of a talk on appendicitis by Dr. C. E. Riseling. Discussion by Dr. Molz, Sabine and Thompson. Also a paper by Dr. R. B. Essick on "Anesthetics." Discussion by Dr. H. C. Mitchell.

A grievance was brought to the attention of the society by Drs. Brandon and Whitacre in regard to a letter received by them from Dr. J. S. Lewis, owner and manager of the Amy Lewis Hospital at Carbondale, advising that they would be permitted to bring to the hospital and treat any medical case, but would not be permitted to do any major operations there.

A motion was made and seconded that a committee of three physicians be appointed by Dr. Brandon to investigate the case. Drs. Essick, Lightfoot and Roth were appointed to make the investigation.

Twenty-five members were present:

LOUIS R. WAYMAN, Secretary.

MADISON COUNTY

Favored by the most auspicious weather, the October meeting of the Madison County Medical Society was held in Edwardsville, October 1, and was marked by a large attendance and a sustained interest. The programs of our society are becoming more and more interesting and this one was not an exception. The subject for discussion was "Gastric and Duodenal Ulcers," and was opened by Dr. O. A. Ambrose of St. Louis, who gave us the most detailed information as to the cause of this condition. He dwelt at length upon the diagnostic indications, taking up differential diagnosis and showing that the most reliable diagnosis could be made by exclusion.

He also said that in some cases medical treatment was successful, but that it required the most rigid treatment and care extending over a period of at least a year.

Dr. Willard Bartlett of St. Louis, followed with an address on the surgical treatment of this condition giving the technique of this operation as developed by himself to the minutest detail, illustrating the procedure by large charts. He carefully classified the medical from the non-medical cases and said that patients suffering from either one of the following complications were absolutely surgical: Cases of perforation, small and repeated hemorrhages, cancer obstruction, and those cases in which medical treatment had failed.

Miss Grace Garrabrant, the community nurse lately secured by our society to make a survey of the county with reference to tuberculosis, was present and addressed the society as to the scope and manner of conducting that work in the several communities of the county. She is here for two or more months and will cover the whole county in the interest of tuberculosis prevention and is receiving the active assistance of the members of our society in the several cities and towns.

The society also allowed bills to the extent of $67.66 for the care of tuberculous patients in the county, in various localities, by furnishing milk and hospital care, and by unanimous vote instructed the members to continue the care of such persons as are in need in making their fight against tuberculosis. E. W. Fiegenbaum, Secretary.

McDONOUGH COUNTY

The McDonough County Medical Society met October 7, in the Bushnell club rooms and had a most excellent meeting. There was a large attendance and the program was excellent throughout.

Dr. H. M. Camp of Monmouth read a paper on "The Management of Abortions."

Dr. S. C. Stremmel gave an instructive lecture on the topic, "The Diagnosis of Appendicitis."

Dr. C. J. Rider presented a paper with "Hernia" as his topic.

Officers were elected as follows: President, Dr. E. R. Miner, Macomb; vice-president, Dr. L. G. Betts, Prairie City; second vice-president, Dr. J. W. Hermetet; secretary and treasurer, Dr. Geo. S. Duntley, Bushnell; necrologist, Dr. J. B. Holmes.

Dr. Henry Knappenburger was selected as delegate to attend the meeting of the State Medical Association. Dr. Frank Russell was chosen alternate.

The next meeting of the society will be held in Macomb the first Tuesday in January.

The following resolution, which was introduced by Dr. LeMaster, will be voted upon at the next meeting:

"I, a member of the McDonough County Medical Society of the state of Illinois, do hereby recommend that the following by-law shall be added to the present by-laws of the McDonough County Medical Society:

"To-wit: That it shall be illegal and an absolute just cause for suspension of any member of this society to collect a fee for or divide any fee with any physician, or surgeon, or any other person.

"That any shift or device for evading this section shall also be just cause for the suspension from this society, or the person using such a shift or device."

McHENRY COUNTY

The annual outing meeting of the McHenry County Medical Society was called to order by the president, Dr. C. W. Goddard, at the Leonard hotel, on the short of Crystal Lake, on Friday, July 23, 1915, at 11:00 a. m.

Dr. Chas. Worcester Hanford, Chicago representative of the Radium Chemical Company of Pittsburgh, Pa., spoke on "Some Radium Physics" and showed some of the forms of applicators by means of which the radium is handled for the therapeutic purposes, together with samples of radium-bearing ore.

Dr. Frank E. Simpson of Chicago demonstrated a series of steriopticon slides showing photographs of many cases of carcinoma, rodent ulcer, lupus erythematosus, nevi, taken before and after treatment and demonstrating the very practical usefulness of radium properly applied in selected cases.

Dr. John A. Robison of Chicago, president of the State Board of Health, was then asked to address the meeting. He said that he had noted in the minutes of the last meeting reference to medical legislation and also to the new rules of the State Board of Health for the control of communicable diseases. In regard to the former, he stated that the most important new medical legislation was that relative to birth and death certificates, which places Illinois in the registration area of the United States. In regard to the latter, he said the State Board of Health is publishing, in pamphlet form, rules for the control of these dis-

eases and will be glad to send a copy to any physician on request and will also send *Illinois Health News* on request.

Dr. Howard D. Eaton of Harvard was elected to membership.

The meeting was then adjourned. Fourteen members were present.

Regular Meeting, September 9, 1915

The September 9, 1915, meeting of the McHenry County Medical Society was called to order by the president, Dr. C. W. Goddard, in Osmond's Hall, Richmond, Ill., at 11:00 o'clock a. m. Present were the speaker, Dr. A. M. Corwin, of the publicity department of the Chicago Department of Health; Dr. and Mrs. B. J. Bill of Genoa Junction, and eleven members.

The minutes of the previous meeting were read by the secretary and approved.

The following resolution was then formally adopted:

"Whereas, at our meeting at Crystal Lake, June 18, 1914, a resolution was passed condemning the practice of doing work for lodges, etc., at less than the regular rates; and

Whereas, we are informed by a deputy of a lodge that examinations are being made by this lodge in Harvard at less than the rate called for in the fee-bill; be it

Resolved, that we again condemn this practice, calling attention to the penalty attaching thereto: and that this resolution be incorporated in the proceedings of the meetings which are sent to each and every member.

A motion was then duly made, seconded and carried that a letter relative to the subject matter of this resolution be sent to each member of the profession in the county.

By a vote of the society, it was decided that the next two meetings be held at Hebron and Marengo in the order named, while the roads are yet good, these towns being difficult of access by rail.

Dr. A. M. Corwin then discussed the "Infectiousness of Colds," in a talk than which the society has listened to none more practical nor interesting.

The meeting then adjourned to the hotel, where the usual chicken dinner was served.

N. L. Seelye, M. D., Secretary.

ROCK ISLAND COUNTY

The regular bi-monthly meeting of the Rock Island County Medical Society was held October 12, 1915, at the new Harper hotel, Rock Island. After a dinner, at which twenty-six participated, the business session was held. Drs. E. A. Anderson and T. C. Walsh of Rock Island, and Dr. J. D. McKelvey of Moline, were elected to membership in the society. The names of Drs. Frank Davenport and P. L. Pearsall of Moline were proposed for membership.

An amendment to the by-laws limiting membership to those who have practiced one or more years in this county was passed.

The following interesting and instructive program was presented:

"Interesting Facts in Ancient Therapeutics," Ralph Dart, Rock Island.

"Syphilis of the Heart and Aorta," W. H. Rendleman, Davenport.

"Demonstration of Lungmotor," C. T. Foster, Rock Island.

Dr. Rendleman illustrated his paper with many excellent original skiagrams. He was tendered a vote of thanks by the society. Thirty-two members and four visitors attended this meeting.

A. E. Williams, Secretary.

WINNEBAGO COUNTY

The Winnebago County Medical Society and the local dental society held a joint meeting at the Nelson hotel, Rockford, on Tuesday evening, October 12. Preceding the special program, a banquet previously arranged for by the dental society was served to all present. The number of dentists and doctors seated around the tables was eighty-four.

At 8:30 Dr. Starkey called the societies to order. Late arrivals had increased the attendance to about 120. Visitors were present from Beloit, Freeport, Belvidere and Elgin.

Dr. Frank Billings of Chicago was introduced by Dr. Starkey and spoke on the subject of "Focal Infections and Their Relation to General Diseases." Lantern slides were used to illustrate his talk. The principal facts brought out by Dr. Billings were as follows:

1. Transmutation of bacteria of one variety into a wholly different variety and back again, the bacteria passing through different strains while being grown or while passing through another animal.

2. The affinity of bacteria for special tissues.

3. The unscrupulous use of stock or shot-gun vaccines should be avoided; bacterial vaccines of a certain strain only should be used.

Dr. Weld of Belvidere introduced Dr. Frederich Morehead, D. D. S., of Chicago, as the next speaker. Dr. Morehead spoke on "The Teeth in Relation to General Diseases." Lantern slides were again used. The emphatic points brought out were: 1. Whenever possible x-ray pictures of all the teeth should be taken with proper precautions as to site of rays and density of bone. 2. Not to try to save the molars when the peridental membrane was destroyed. 3. The saving of anterior teeth might be done by surgical removal of apices of teeth and curetting area. 4. Better mechanical dentistry should be done to counteract against general disease. Be careful about pulling too many teeth at one sitting.

Both speakers were warmly applauded. The meeting was then adjourned.

Dr. C. M. Ranseen, Secretary.

Personals

Dr. J. H. Riley, DeKalb, is reported to be seriously ill.

Dr. and Mrs. Frederick E. Tulley, Granite City, have returned after a summer spent on the Pacific coast.

Dr. Anthony Balcerzak, Chicago, has been elected chief medical examiner of the Polish National Alliance.

Dr. and Mrs. Arnold C. Klebs, Switzerland, formerly of Chicago, will spend the winter in Washington, D. C.

Dr. George A. Zeller, Peoria, alienist of the state board of administration, has been appointed a member of the board.

Dr. I. M. Miller, Chicago, has removed to Kewanee, Ill., and will limit his practice to the eye, ear, nose and throat.

Dr. Matilda O. Ennis of 11221 Forrestville avenue, Chicago, has removed to 1336 Los Palmas ave., Los Angeles, California.

Dr. and Mrs. Chas. Adams have returned to Chicago after an absence of two years in Hawaii, the West Indies and Central America.

Dr. Edward Bollinger has been appointed resident surgeon for the Missouri Pacific, Iron Mountain & Southern Railway Company at Dupo.

Dr. William S. White was operated on at the Evanston Hospital, October 8, for appendicitis and the removal of gallstones, and is reported to be improving.

Dr. Evarts A. Graham, assistant professor of surgery at Rush Medical College, has located at Mason City, Iowa, and has been appointed chief surgeon to the Park Hospital.

Drs. Albrecht Heym, Sidney Kuh and George W. Hall have been appointed members of the attending staff of the Psychopathic Hospital, connected with Cook County Hospital.

Dr. Harry L. Kampen has been elected president; Dr. Ralph Graham, vice-president and Dr. Charles P. Blair, secretary-treasurer of the medical staff of the Monmouth Hospital.

Dr. Reinhard Rembe, Chicago, is reported to have been decorated with the Iron Cross by the German emperor. Dr. Rembe has been in service with the German army since the outbreak of the war.

News Notes

—The Twentieth State Conference of Charities and Correction was held in Danville, October 23 to 26, under the presidency of Dr. George T. Palmer, Springfield.

—The Illinois Association of County Home Superintendents and Illinois Probation Officers Association held their annual sessions in Danville, October 22 and 23.

—The meeting of the Aesculapian Society of the Wabash Valley at Paris, was postponed a week, to November 4, on account of the funeral of Dr. Isaac L. Firebaugh of Robinson.

—Dr. Patrick M. Kelly, superintedent of the Kankakee State Hospital, ordered that all the employees and patients in the institution, nearly 4,000 in number, be inoculated against typhoid fever.

—The seventh annual meeting of the Illinois Association for the Prevention of Tuberculosis was held in Danville, October 23, in conjunction with the meeting of the state conference of charities.

—The council of the Chicago Medical Society passed resolutions of sympathy for Dr. Robert B. Preble at its meeting October 12. Mrs. Preble and her mother lost their lives in a fire in his residence October 6.

—The advisory attending staff of the Chicago Psychopathic Hospital, after an investigation of the needs of the institution, recommended that more beds are needed and that the hospital shall be so arranged that patients can be segregated according to their diseases.

—The sixteenth meeting of the Robert Koch Society for the Study of Tuberculosis, Chicago, was held at noon, October 18, at the City Club, Chicago, when Dr. Francis M. Pottenger, Monrovia, Calif., gave an address on "The Diagnosis of Tuberculosis by Palpation."

—Dr. Francis M. Pottenger, Monrovia, Calif., gave a clinic and demonstration in the amphitheater of Rush Medical College, October 16, on "Tuberculosis," under the auspices of the Rush Medical College Ambulatorium of the Chicago Municipal Tuberculosis Sanatorium.

—The council of the Chicago Medical Society, as the result of the arrest and holding in jail

over night of a respected member of the profession for an alleged infraction of the Anti-narcotic Law, passed resolutions placing the society on record as in sympathy with the proper enforcement of the law, and calling on the district attorney and chief of police not to serve warrants against members of the profession, under this law, except between the hours of 9 a. m. and 4 p. m., when courts are in session, so as to give an opportunity for furnishing bail. In the case above mentioned, the physician was promptly discharged from custody by the United States commissioner upon a statement of the case.

—At a meeting of the Chicago Physicians' Club, October 19, the subject for discussion was, "Our Jails and Other Penal Institutions." Judge Jacob H. Hopkins of the Municipal court presided. From his remarks it became quickly evident that not only the jails but even some of the court rooms in Chicago were in an intolerable condition. Mr. John L. Whitman, superintendent of the House of Correction, whose progressive ideas of prison management have made an appeal to the manhood of many hardened prisoners and caused many to reform, related in some detail his efforts to improve the conditions. Emory Sanford Hall, architect, talked on ideals of prison construction. Miss Harriet Vittum, civic director of the Woman's City Club, who has made a personal survey of numerous prisons, both in this country and abroad, said that with few exceptions Chicago's jails are a disgrace hardly to be equalled outside of Turkey. She appealed to the profession to use its influence for legislation and funds to place Chicago in the class of civilized communities.

Marriages

James Francis Cox, M. D., to Miss Elizabeth Wise, both of Chicago, September 11.

Vernon C. David, M. D., Chicago, to Miss Marguerite Record of Minneapolis, October 16.

Harry Pierce Reuss, M. D., Granite City, Ill., to Miss Ruth Hill of East St. Louis, Ill., October 5.

Charles E. S:sson, M. D., to Miss Bertha E. Vollman, both of Elgin, Ill., at Los Angeles, September 1.

Russell Adams Scott, M. D., Evanston, Ill., to Miss Julia Beauchamp Hinkle of Hawesville, Ky., October 14.

Clarence Vernon Smith, M. D., Tipton, Ind., to Christine Lukas, M. D., of Evanston, Ill., September 8.

Frank Chalmers McClanahan, M. D., Viola, Ill., a medical missionary to Egypt, to Miss Helen Smith of Waverly, Ohio, September 15.

Deaths

Payton Chester Madison, M. D. College of Physicians and Surgeons, Chicago, 1893; aged 52; died October 1, from heart disease.

Charles B. Roberts, M. D. Ensworth Medical College, St. Joseph, Mo., 1890; died at his home in Towanda, Ill., September 21, from heart disease.

John Schnee Thompson, M. D. Rush Medical College, 1873; aged 68; died at his home in Palestine, Ill., July 12, from hemorrhage of the stomach.

Carl N. McCaslin, M. D. Medical College of Indiana, Indianapolis, 1902; aged 39; of Earl Park, Ind.; died in the Washington Park Hospital, Chicago, September 17, from peritonitis.

George W. Combs, M. D. Cincinnati College of Medicine and Surgery, 1879; aged 77; a member of the Illinois State Medical Society; died at his home in Ridgway, Ill., July 2, from endocarditis.

M. M. Welsh, M. D. Keokuk, Iowa, Medical College, 1896; aged 52; a member of the Illinois State Medical Society; died at his home in Odell, Ill., September 28, from pneumonia complicating typhoid fever.

Claude Earl Bucher, M. D. Northwestern University Medical School, Chicago, 1912; aged 32; of Williamsville, Ill.; was killed October 5 by the overturning of his automobile while responding to a professional call.

Pearl Tinkler, M. D. Barnes Medical College, St. Louis, 1911; aged 26; of Taylorsville, Ill.; formerly a Fellow of the American Medical Association; died in the Baptist Hospital, St. Louis, August 9, from septicemia.

FRANK LEWIS PEIRO, M. D. University of Vermont, Burlington, 1866; aged 76; for more than forty years a practitioner of Chicago; a veteran of the Civil war; died at the home of his daughter in Evanston, Ill., October 12.

JOHN G. MCGUIRE, M. D. Jefferson Medical College, 1861; aged 88; until 1895, a practitioner and druggist of Anamosa and Mechanicsville, Iowa; died at the home of his son in Chicago, September 5, from cerebral hemorrhage.

CAMERON CHAMBERLIN, M. D. Medical Colleg of Indiana, Indianapolis, 1902; aged 36; a Fellow of the American Medical Association; a well-known practitioner of Indianapolis; died in the Presbyterian Hospital, Chicago, October 4, from spinal meningitis.

JACOB MILTON BOSART, M. D. Medical College of Ohio, Cincinnati, 1858; Miami Medical College, Cincinnati, 1867; aged 81; died July 16, from malignant prostatitis, at the home of his daughter in Sumner, Ill., where he had resided for fifty-seven years.

BYRON C. ELMS, M. D. Chicago Homeopathic Medical College, 1880; formerly a member of the Nebraska State Medical Association; a practitioner of Chadron, Neb., until 1912, and since that time a resident of Chicago; died at his home in Chicago, September 9.

FRED JULIUS PARKHURST, M. D. Northwestern University Medical School, Chicago, 1880; aged 60; a Fellow of the American Medical Association; a director of the First National Bank of Danvers, Ill.; a prominent practitioner of McLean county; died at his home in Danvers, September 4.

BENJAMIN F. HALL, M. D. Louisville Medical College, 1877; aged 61; who practiced in Rock Island since 1894, giving special attention to diseases of the eye, ear, nose and throat; held in high professional and personal esteem; died after several years' illness from pernicious anemia, October 17.

ISAAC L. FIREBAUGH, M. D. Miami Medical College, Cincinnati, 1875; member of the Illinois State Medical Society; a Fellow of the American Medical Association; member of the Aesculapian Society of the Wabash Valley; an old and honored member of the Crawford County Medical Society, of Robinson, Ill., died October 25.

Book Notices

DISEASES OF THE NOSE AND THROAT. By Algernon Coolidge, M. D., Professor of Laryngology in the Harvard Medical School. 12mo. of 360 pages, illustrated. Philadelphia and London: W. B. Saunders Company, 1915. Cloth, $1.50 net.

This little book is especially adapted to the use of the student. Various methods of examining the throat and nasal cavities are described in an admirable way and are unusually clear.

The diagnoses of various conditions are considered as fully as the size of the book will permit, and treatment given accordingly. Established facts are emphasized, while the text is brief. The book will form an admirable guide for students and for clinical work.

MARIE TARNOWSKA, by A. Vivanti Chartres, with an introductory letter by Professor L. M. Bossi of the University of Genoa. Published by the Century Company, New York, MCMXV. Price, $1.50 net.

From a medical standpoint, the story of the life of Marie Tarnowska is interesting. The book was written, not as a plea for clemency, for Marie Tarnowska has paid the penalty exacted by the law of Italy, not in extenuation of her crime—if crime she committed—but was written rather to present the physiological and psychological elements, which the court did not take cognizance of.

The book does not seek to make Marie Tarnowska better than she is—in fact, we surmise it has painted her character and actions rather black—but it does show the life she was thrown into and from which she could not escape, although at various times she tried, and the added results of disease and drug addictions, as they had to do with her mental weaknesses, her enforced criminal complications and final punishment.

The book is really a plea to the layman for more intelligent interpretation and treatment of offending individuals who are not responsible because of disease, mental morbidity, and drug addictions.

The book was written at the suggestion of Prof. L. M. Bossi, of the University of Genoa, the Italian alienist and gynecologist, and is the story of the entire life of Marie Tarnowska, told by that unhappy lady to Mrs. Anne Vivanti Chartres, the author who has published the story as related to her.

PRINCIPLES AND PRACTICE OF OBSTETRICS, New (2nd) edition, thoroughly revised.

PRINCIPLES AND PRACTICE OF OBSTETRICS. By Joseph B. De Lee, A. M., M. D. Professor of Obstetrics at the Northwestern University Medical School. Second edition, thoroughly revised. Large octavo of 1,087 pages, with 938 illustrations, 175 of them in colors. Philadelphia and Lon-

don: W. B. Saunders Company, 1915. Cloth, $8.00 net; half morocco, $9.50 net.

De Lee's work on obstetrics is now so well known in America that little need be said concerning it. Four printings were necessary to supply the demand for the first edition. In this second edition (August, 1915), the chapters on Abderhalden pregnancy reaction, on "Twilight Sleep," on dry labor, labor in old primiparae, blood pressure, and eatraperitoneal cesarean section have been very materially enlarged.

The work was written primarily as a text-book, but perhaps more nearly fills the needs of the general practitioner than any other American texts on obstetrics.

The volume is so large and covers the obstetrical teaching so completely, that a creditable review would be too lengthy for our space.

One must not pass, however, without mention of the nine hundred thirty-eight illustrations, one hundred seventy-five being in colors. Some of these are photographs, others drawings—excellent ones—and a few others are diagrams.

Two sizes of type are used—much of the detail being in small type—so that the work might be contained in one volume.

Every practitioner should possess a copy of this work, and no medical library is complete without it.

REPORT OF THE BUREAU OF HEALTH FOR THE PHILIPPINE ISLANDS for the fiscal year from January 1 to December 31, 1914. Victor G. Heiser, M. D., Director of Health, Surgeon, United States Public Health Service. Manila Bureau of Printing, 1915.

THE UNIVERSITY OF THE PHILIPPINES, COLLEGE OF MEDICINE AND SURGERY, including the Department of Dentistry, the Graduate School of Tropical Medicine and Public Health, and the School Pharmacy. Ninth Annual Announcement and Catalogue. Reprint from the Bulletin No. 5. Manila Bureau of Printing, 1915.

QUARTERLY REPORT OF BUREAU OF HEALTH FOR THE PHILIPPINE ISLANDS. First quarter, 1915. To the Secretary of the Interior. J. D. Long, M. D., Director of Health, Surgeon, United States Public Health Service. Manila Bureau of Printing, 1915.

"SENESCENCE AND REJUVENESCENCE." By Charles Manning Child, Ph. D., Associate Professor of Zoology in the University of Chicago. XII + 492 pages, 8 vo., cloth. Price, $4.00; postage extra (weight 3 lbs.). The University of Chicago Press, Chicago, Illinois.

The author has taken up this subject in a thoroughly scientific way and has given the fruits of his labor in this volume. The problem is a most difficult one, on which the author has done an enormous amount of original work.

It is a most interesting subject, treating, as it does, with the process of growing old and making young again. Whether the aged human can ever be made young again is questionable.

Some of the important questions taken up by the author are:

1. How do young and old organisms differ from each other, and what is the nature of senescence?
2. Is it a feature of the fundamental process of life or the result of incidental conditions?
3. Does it occur in all organisms or only in the more complex and highly differentiated forms?
4. Does it lead sooner or later to death or is there a rejuvenescence of old organisms or parts possible?

The book contains some two hundred figures, about half of which are illustrative of the author's own experiments.

WHAT TO EAT AND WHY. By G. Carroll Smith, M. D., of Boston, Mass. Second edition, thoroughly revised. Octavo of 377 pages. Philadelphia and London: W. B. Saunders Company, 1915. Cloth, $2.50 net.

This excellent work appears in its second edition, with considerable revision and new matter added. Changes in our conception of rheumatism have caused a new chapter to be written. It is not a complete book on dietetics, but for one who wishes to know what to give and why, in the more important diseases, it will thoroughly fulfill its function.

DISEASES OF THE SKIN AND THE ERUPTIVE FEVERS. By Jay Frank Schamberg, M. D., Professor of Dermatology and Infectious Eruptive Diseases in the Philadelphia Polyclinic and College for Graduates in Medicine. Third edition, revised. Octavo of 585 pages, 248 illustrations. Philadelphia and London: W. B. Saunders Company, 1915. Cloth, $3.00 net.

The name of the author is evidence enough of the excellence of this work. It is exceptionally well illustrated in black and white, and the subject amply covered. New matter is observed throughout this edition, likewise considerable revision. The chapters on syphilis, test and treatment, have been brought up to date, and a chapter on Rocky Mountain Spotted Fever added. It is a book intended for the student and practicing physician.

A TEXT-BOOK OF PATHOLOGY. By Alfred Stengel, M. D., Professor of Medicine, University of Pennsylvania, and Herbert Fox, M. D., Director of the Pepper Laboratory of Clinical Medicine, University of Pennsylvania. Sixth Edition, Reset. Octavo of 1,045 pages, with 468 text-illustrations, many in colors, and 15 colored plates. Philadelphia and London: W. B. Saunders Company, 1915. Cloth, $6.00 net, half Morocco, $7.50 net.

The fact that a sixth edition is before us gives evidence of its popularity as a standard text-book of pathology. It is noted that many changes have appeared, notably the addition of a new section on transmissible diseases and the terata. The glands of internal secretion have been made the subject of a separate chapter, which is timely, keeping apace with the great amount of work done in this branch of medicine. It is noted that wherever changes were necessary to make this a modern text-book, complete revision was done. For students and physicians needing a text-book Stengel can be recommended.

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